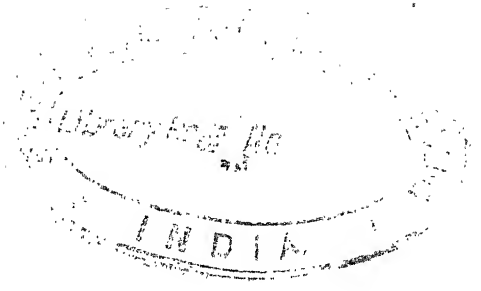

TRANSACTIONS

OF

THE ASIATIC SOCIETY

OF JAPAN.

VOL. XIV.

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ASIATIC SOCIETY OF JAPAN.

MINUTES OF MEETINGS.

Tōkyō, Oct. 21st, 1885.

A General Meeting of the Asiatic Society of Japan was held at the Library, No. 33, Tsukiji, on Wednesday, October 21st, at 4 p.m., B. H. Chamberlain, Esq., Vice-President, in the Chair.

The Librarian intimated that the usual exchanges had come to hand, including the last 15 volumes of *Le Journal Asiatique* and three large volumes of Scientific Memoirs from Halle.

A paper upon the "Tenets of the Shinshiu or 'True Sect' of Buddhists" by James Troup, Esq., H.M. Consul at Hyōgo, was read by the Corresponding Secretary.

The Chairman, after inviting remarks upon the subject, said he was sure that all present would join him in thanking Mr. Troup for his valuable paper upon a subject of such difficulty.

The meeting adjourned.

Tōkyō, Dec. 16th, 1885.

A General Meeting was held at the Library, No. 33, Tsukiji, on December 16th, 1885, at 4 p.m., N. J. Hannen, Esq., President, in the Chair.

The minutes of the last General Meeting, having been published in the *Japan Mail*, were taken as read.

Dr. C. G. Knott, F.R.S.E., read a paper on "The Abacus; and its Scientific and Historic Import."

The President, after conveying the thanks of the Society to Dr. Knott for his interesting paper, declared the meeting adjourned.

Tōkyō, Feb. 17th, 1886.

A General Meeting was held in the Library, No. 33, Tsukiji, on Wednesday, the 17th of February, 1886, at 4.30 p.m., the Rev. Jas. L. Amerman, D.D., Vice-President, in the Chair. The minutes of the last General Meeting, having been published in the *Japan Mail*, were taken as read.

The Corresponding Secretary, as Librarian, announced that a large number of volumes, the publications of the Smithsonian Institute of Washington; the *American Journal of Philology*, and the *American Chemical Journal*, the pub-

lications of the Johns Hopkins University; the Reports, etc., from the United States Geological Survey; also the Transactions of the Academy of Sciences of Finland (Helsingfors) and the *Acta Societatis Scientiarum Fennicæ* (Helsingfors), had been received by the Society.

The Rev. J. Summers read a paper on "Buddhism and Traditions concerning its Introduction into Japan."

Mr. Chamberlain read a short paper entitled "Past Participle or Gerund? A Point of Grammatical Terminology."

Captain Brinkley then begged permission to offer a suggestion. He had been, he said, a constant reader of the Society's Transactions for many years, indeed ever since the Society came into existence, and while he did not desire to say a word which might seem depreciatory of the high standard of learning and research displayed by the various contributions, it had always appeared to him a matter of much regret that the circle of contributors was so limited. The present system he thought, was to some extent answerable for this. Essays destined for publication in the Transactions were required to be sufficiently exhaustive to stand alone, and their preparation consequently became such a tax upon the time and knowledge of their authors, that only specialists and sinologues thought of contributing. Yet there was undoubtedly among the members of the Society much general information, which, if collected in fragments, might constitute a highly instructive and interesting whole. He observed that the China Branch of the Asiatic Society made provision to enlist the coöperation of its affiliates at large by suggesting a subject for discussion and inviting members in various parts of the country to send in monographs, however short, embodying their views or the teachings of their experience. Among subjects thus suggested, with excellent results, he might mention "Infanticide" and "Filial Piety." He ventured to think that a similar course might be advantageously pursued by the Asiatic Society of Japan. No other expedient offered for widening the circle of contributors, giving greater vitality to the work of the association, and inducing members to place on record impressions and observations not sufficiently extended to furnish material for complete papers, or the outcome of researches not conducted with any view to independent publication. If the Society agreed with him as to the expediency of this course, he would further suggest that it might be advisable to be as definite as possible in the choice and statement of subjects, because any latitude left to members in such a matter would probably be converted into an excuse for not contributing at all.

The Chairman, in reply, said he was happy to inform the meeting that a plan somewhat similar to that mentioned by Captain Brinkley had just been decided upon by the Council, and he hoped that members would recognize their duty to the Society and give as much assistance as they could. A circular relating to this subject was about to be issued in the name of the Society, with special subjects of enquiry attached thereto.

The meeting then adjourned.

YOKOHAMA, May 5th, 1886.

A General Meeting was held in the Yokohama Public Hall, on Wednesday, May 5th, at 9 p.m., N. J. Hannen, Esq., President, in the Chair.

The minutes of the last General Meeting having been published in the *Japan Mail*, were taken as read.

J. Conder, Esq., read a paper on "The Art of Landscape Gardening in Japan."

After the usual votes of thanks, the meeting adjourned.

TŌKYŌ, June 23rd, 1886.

The Annual Meeting was held on Wednesday, June 23rd, 1886, at the Society's Rooms, 33, Tsukiji, Tōkyō, the President, N. J. Hannen, Esq., in the Chair.

The minutes of the preceding meeting were taken as read.

The election of the Rt. Rev. Bishop Bickersteth, and S. Mori, Esq., was announced.

The Secretary then read a *résumé* of a paper on the "Vine in Japan," by Mr. J. Dautremer, the original paper being in French.

THE VINE IN JAPAN.

According to accounts furnished by Mr. Fukuwa Yaito, Director of the Vineyards at Harima, and from official reports of the Minister of Agriculture and Commerce, translated from the Japanese by Mr. J. Dautremer, Interpreter to the French Legation in Japan, the vine is found nearly everywhere in Japan, but it is cultivated more especially in the province, or rather district, of Kōfu, in the centre of the country. There is a tradition that 700 years ago, in the reign of the Emperor Gotoba, A.D. 1185, it was noticed by two peasants on the mountains of Kōfu, near the village of Kami-iwasaki. The peasants, whose names are preserved, transported this wild vine to their garden at Ziō-sei-zi, and after carefully tending it and endeavouring to propagate it, they succeeded so far that in 1193 they became possessed of thirteen plants. They proceeded to develope the culture, and in a few years were able to lay out plantations, the fruits of which became celebrated, and the reputation of the Kōfu grape still stands high, the fruit being greatly esteemed.

There are two species of vine,—the *vitis vinifera* and the *vitis labraska;* but the former only is cultivated. Its fruit is much esteemed. The latter, superior to that found in America, is inferior, however, to the *vitis vinifera*. It is found in the mountains, where it shoots out like grass. It abounds in the provinces of Echiu, Kaga, Noto, Hida, Mutsu, Uzen, Ugo and in Hokkaido. In Echiu and Kaga, as well as in Hokkaido, several varieties of the wild vine are found—as many as twelve; some with stems indicating a growth of a dozen years. On the

mountains of Kaga the author of this paper met with a vine the stem of which measured 1m. 80cm. in circumference, and covering a hectare of land, having produced, morever, 1,200 kilogrammes of fruit.

Such dimensions are not rare; many examples are found in the province of Idzu. Specimens of this size are not found in Europe; but at Oran and at Kasba in Algeria, vines with a diameter 0.24cm. and area 120m. and fruit 1,000 kilogrammes occur. This is looked upon as prodigious. Unfortunately, the Japanese have overlooked the value of this plant, and have left it to run wild, without special care being bestowed upon it. It is only in quite recent times that they have begun to engage themselves on its cultivation and to take an interest in the fruits.

The *V. vinifera* in Japan produces three sorts of grapes; the *red*, like the *Chablis*; the *black*, like the *Frankenthal*; and the *white*, like the *Riesling*. They are all found in Kōfu. The black grape grown near Kyōto is the best in Japan.

Formerly the grape was only cultivated for eating. The plant in its wild state shows great vitality, and the yield is considerable; but latterly the Japanese have grafted and transplanted it and have found that it is capable of furnishing a good quality of wine-grape.

In the cultivation of the vine two methods are in vogue, as in Europe, viz: (1) by slips inserted into the ground; (2) by allowing the vine to propagate itself by its branches taking root. This latter is the way in which the vine-dressers of France renew their plantations.

The Japanese prefer for the vine sloping lands—stony or sandy. After digging a ditch 1m. 20cm. deep and about 2 metres wide, and having made the channels so that the water may flow freely, they fill the ditch with manure and earth and proceed to plant. This is usually done in autumn; but in Hokkaido, where the climate is cold, the spring is preferred. For manure they use bone-dust, rice-husks, the refuse of brewers, the residuum of oil manufacture, and finally closet-manure. But these manures have each their specific properties. The bone-dust, the rice-husks, and the *saké* refuse give to the grape a certain sweetness, and increase its size; the other manures give force to the plants and make the bunches more compact and complete. It is therefore necessary to employ a mixture to obtain good results.

The pruning is done in the autumn; the stem is left 1m. 80cm. high, so that below the section two or three branches or shoots may be left for the coming spring.

First Attempt at Wine-making.

The first idea of the Japanese was to cultivate the vine in order to eat the fruit; yet we are told that the people of Kōfu used the grape to make a liqueur, probably a sort of wine; for what purpose we do not know, for they certainly did not drink it. It was not until 1875 that an inhabitant of Kōfu resolved to make wine of the grape. But he neither knew the ancient nor the modern processes; the

grapes which he used were not sufficiently ripe, and he did not succeed. In 1876, a certain person named Ōto Matsugoro, having returned from California, where he had studied wine making, again made an attempt in Kōfu, and succeeded in producing a wine superior to that of his predecessor. Now the same vineyard produces 200 hect. of white wine, and as much alcohol. I have tasted several kinds of Kōfu wine, and I declare that it was detestable. At the present time in Hokkaido and in the provinces of Harima and Owari, some thousands of hectolitres of wine have been made, and yet the plants are only 5 or 6 years old and the bunches are naturally not large. In two or three years no doubt twenty to thirty thousand hectolitres will be produced, but it is doubtful whether the wine will be drinkable here for a long time. The produce is mixed by Japanese merchants with European wines, and sometimes this mixture is sold to the Japanese as pure Bordeaux.

European and American Vines Imported into Japan.

The first European vine transplanted into Japan was given to the *Shōgun* by the Emperor Napoleon III. in 1868; afterwards came the Isabella and the Concord from America. They then imported the Frankenthal from Austria, as well as other vines from France; at last California furnished a considerable number of plants. We may say that there are altogether some 200 sorts in Japan. The attempts to cultivate them had generally been made in Tōkyō, at the Botanic Garden at Mita; but none have succeeded. For the European vine the soil of Tōkyō is too damp; although the vine grows well there it produces no fruit; the American vine only succeeds in Tōkyō; but the bunches, although superb, are not of the first quality; they are certainly much inferior to Japanese grapes. Thus at present it is found that the proper way is to introduce vine-stocks from Europe, and those only which produce well.

The chief plantations are to be found in Harima and also in Kiushiu. In this latter island the *Muscat Pinot* and the *Chasselas* succeed marvellously, thanks to the geological nature of the soil. The *Chasselas* succeeds very well in the district of Harima, producing large and full bunches.

The Grape of Palestine has only been planted two years and has already given very fine results. Last year Mr. Fukuwa Yaito, director of the Gardens at Harima, gave a bunch of these to Mr. Sarazin, adviser to the Minister for Foreign Affairs, and he in turn presented it to the French Minister. It weighed 3 kilogs.

Viticulture in Japan.

The Government encourages the culture of the vine by the establishment of schools of viticulture, and by bringing from Europe a considerable number of young plants, and there is little doubt but that in a short time Japan will become a vine-growing country. They have introduced into the Harima establishment the *Gamay de Bordeaux* and *Pinot Noirien*, and they hope soon to produce wine from them.

The Harima grounds are 30 hectares; those of Owari 50 hectares, and those of Hokkaido 40 hectares. The vines which succeed best in these places are: The *Gamay de Bordeaux*, *Bordeaux Blanc*, *Baltet Noir*, *Meslier Blanc*, *Meslier Noir*, *Frankenthal*, *Folle Blanche*, *Charbonneau*, *Muscat de Frontignan*, *Zinfindal*, *Riesling*, *Malvoisie*, etc.

Diseases of the Vine.

The chief are the *oïdium* and the *brouissure*. These began in 1867, and since then the stems of the vines have suffered more or less. The ordinary remedy for the *oïdium* is sulphur; but no means has been found to get rid of the *brouissure*. As the stems of the vines in Japan are larger than those in Europe, the diseases are more difficult to cure. Insects are the great enemies to the vine, but they are comparatively easy to destroy if care is taken, and especially if the *Phylloxera vastatrix* be not present. This insect had not yet appeared here until last year, 1885. It has been necessary to scorch the soil occupied by the affected vines, This is a perfect remedy. The Japanese believe that this insect was brought to Japan from America with the vines imported in 1881.

Yield.

Before the appearance of the *oïdium*, 17,000 to 20,000 kilogrammes per hectare were harvested in the provinces of Kōshiu (Kōfu), Kawachi and Yamashiro; but after 1867 the yield fell off suddenly 3,000 to 3,500 kilogrammes. It is, however, expected that with care the disease will disappear and the yield be increased. The most productive vines are the *Zinfindal* and the *Folle Blanche;* the average yield being 18,000 kilogrammes per hectare after five or six years' culture. These plants are superior to the Japanese, and their proneness to take disease is much less. The year 1885 was less favourable and the yield was low; it was only in Kōshiu and Hokkaidō that the vine succeeded. The heavy rains which fell at the time of blossoming in Kawachi, Harima, and Owari, and the inundations which followed, destroyed nearly all the blossoms, and the vines suffered very much.

After this a few remarks were made by Mr. J. C. Hall, generally confirming the views expressed in Mr. Dautremer's paper.

Because of the press of other business, Mr. Hall agreed, on the suggestion of the President, to postpone to the general meeting the introduction of the motion relative to the Society's attitude towards the transliteration movement.

The Annual Reports were then presented to the Society, and were adopted on the motion of the Hon. P. Le Poer Trench.

The President moved, seconded by the Corresponding Secretary, that the Society record their thanks to all who during the past year have presented books, maps, and other valuable gifts to the Library.

The motion was agreed to unanimously.

REPORT OF THE COUNCIL FOR THE SESSION 1885-6.

The Council has to report that during the past session a number of interesting papers has been presented to the Society, but it has to regret that the monthly general meetings had to be postponed three times owing to the want of papers to read before the Society; and the Council would respectfully call the attention of the members of the Society to the necessity of exerting themselves to furnish papers on some subject which it is the object of the Society to elucidate. The papers need not in every case be very long or very learned, but should contain information, or show research calculated to throw light upon the history, the religions, the languages, the natural productions or natural phenomena of the East, and especially of Japan. The discussions on such papers would frequently be of great interest and value, independently of the value of the original papers.

In the subjoined list (Appendix *A*) will be found an enumeration of the papers read before the Society and the names of their authors.

In another list (Appendix *B*) are given the names of the books and maps contributed to the Society's Library, and the names of the periodicals, etc., with which the Society exchanges its publications. It will be observed that some most valuable works have been contributed by the Smithsonian Institute of Washington.

Many volumes have been bound, and others are to be bound as soon as the missing numbers of certain periodicals are forthcoming. In regard to this point, members are requested to return as soon as convenient any books or periodicals which they may have borrowed, in order that the Librarian may discover, if possible, any missing volumes.

The Council has to express its sorrow in recording the death of one of the oldest friends of the Society—Rear-Admiral Shadwell—who always took great interest in its welfare, and contributed to its success in the beginning of its career.

The name also of Thomas R. H. McClatchie, of H.M.'s Consular Service, cannot be omitted. He died at Penang on his way home last year at an early age, having given proofs of a sound scholarship; in his death there is much to be regretted.

The Society has lost a few of its members, but has increased the number on the roll by some eight or ten new members.

In Appendix *C* will be found the Treasurer's report.

Appendix *A*.

List of Papers Read Before the Society During the Session 1885-6.

On the Tenets of the Shinshiu or "True Sect" of Buddhists; by James Troup.

The Abacus in its Historic and Scientific Aspects; by Cargill G. Knott, D. Sc. (Edin.), F.R.S.E.

Buddhism, and Traditions Concerning its Introduction into Japan; by Rev. James Summers.

Past Participle or Gerund? A Point of Grammatical Terminology; by Basil Hall Chamberlain.

Notes on Japanese Landscape Gardening; by Josiah Conder.

Situation de la Vigne dans l'Empire du Japon; par M. Joseph Dautremer.

Appendix B.

Books Presented to the Society, 1885-6.

Le Journal Asiatique (1873-85); by the *Société Asiatique* of Paris.

Nova Acta Academiæ (Halle), 3 vols.; by the Society.

Indogermanische Grammatiken—Band II. Supplement. The Roots and Verb-forms of the Sanskrit Language; by Professor William Dwight Whitney of Yale College.

A Roll of Maps from the Geological Survey Office of the Dominion of Canada.

Japanische Märchen; by Professor Dr. D. Brauns, of Halle.

Über d. Japanische Wildschwein; by Dr. Nehring, of Berlin.

Fernere Nachträge zu den Bemerkungen über den Geographischen Verbreitung der Säugethiere Japans; by Professor Dr. D. Brauns, of Halle.

Kotoba no Sono, or "Garden of Language"—a Japanese Dictionary, 6 vols.; by M. Kondo, Esq.

Australia: a Charcoal Sketch; by Frank Cowan.

A Visit in Verse to Hale-maumau; by the same.

The Terraces of Robomahana, a Poem; by the same.

A History of Japan in Japanese (after European models); by the author.

Publications of the Smithsonian Institute of Washington: Miscellaneous Collections, 14 vols., Contributions to Knowledge, 21 vols., Smithsonian Report, 1882.

Reports of the Director of the Bureau of Ethnology, one volume.

The Census of the United States. From the State Department.

United States Geological Survey Reports, 1880-1881, 1881-1882, 1883, 3 vols.

United States Survey of Territories Wyoming and Idaho, 2 vols.

Books Purchased from Dr. Faulds.

The Chinese and Japanese Repository, 2 vols.

Faber's "Confucius."

Beal's "Dhammapada."

List of Exchanges.

Academy of Natural Sciences, Philadelphia.

Agricultural and Horticultural Society of India, Journal.

American Geographical Society, New York; Bulletin and Journal.

American Oriental Society.
American Philological Society.
American Philosophical Society.
Annalen des K. K. Natur Hist. Hofmuseum, Wien.
Anthropological Institute of Great Britain and Ireland.
Anthropologischen Gesellschaft in Wien.
Asiatic Society of Bengal; Journal and Proceedings.
Australian Museum, Sydney.
Bataviaasch Genootschap; Notulen.
Bataviaasch Genootschap; Tijdschrift.
Bataviaasch Genootschap; Verhandelingen.
Boston Society of Natural History.
California Academy of Sciences.
China Review; Hongkong.
Cosmos; di Guido Cora, Turin.
Das Handels-Museum, Wien.
Geological Survey of India; Records.
Harvard University Museum of Comparative Zoology; Bulletin.
Imperial Russian Geographical Society; Bulletin.
Imperial Russian Society of the Friends of Natural Sciences, Anthropology and Ethnology of Moscow.
Japan Weekly Mail, Yokohama.
Johns Hopkins University, Publications, Baltimore.
Journal Asiatique, Paris.
Kaiserliche Leopoldinische Carolinische Deutsche Akademie der Naturforscher; Verhandlungen.
Mittheilungen des Deutschen Gesellschaft für Natur- und Völkerkunde Ostasiens.
Musée Guimet, Lyons, Annales et Révue, etc.
Museum of Comparative Zoology, Cambridge, Mass.
Numismatic and Antiquarian Society, Philadelphia.
Oesterreichische Monatsschrift für den Orient.
Ornithologischer Verein in Wien.
Observatoire de Zi-ka-wei; Bulletin des Observations.
Royal Asiatic Society of Great Britain; Journal, etc.
Royal Asiatic Society, Bombay Branch; Journal.
Royal Asiatic Society, Ceylon Branch; Journal and Proceedings.
Royal Asiatic Society, North China Branch; Journal.
Royal Asiatic Society, Straits Branch; Journal.
Royal Geographical Society; Proceedings.
Royal Society; Proceedings.
Royal Society; New South Wales.
Royal Society of Tasmania.

Royal Society of Queensland.
Seismological Society of Japan, Transactions.
Smithsonian Institute, Washington, D.C.; Reports.
Smithsonian Institute, Bureau of Ethnology.
Sociedad Geografica de Madrid; Boletin.
Société Academique Indo-Chinoise, Saigon.
Société de Géographie; Bulletin et Compte Rendu des Séances, Paris.

As a preliminary to the formal election of Officers and Members of Council for the ensuing year, it was moved by Sir Francis Plunkett, seconded by Mr Gubbins, that the offices of Corresponding Secretary and Librarian be combined for another year, as they had been during the past two years. The motion was carried by a large majority.

The ballot for officers and members of Council resulted as follows :—
President :—N. J. Hannen, Esq.
Vice-Presidents :—B. H. Chamberlain, Esq., Rev. Dr. J. L. Amerman.
Corresponding Secretary and Librarian :—Rev. J. Summers.
Recording Secretaries :—Dr. C. G. Knott, W. J. S. Shand, Esq.
Treasurer :—M. N. Wyckoff, Esq.

Council :

Dr. E. Divers, F.R.S.	N. Kanda, Esq.
J. M. Dixon, Esq.	Dr. D. MacDonald.
J. H. Gubbins, Esq.	Rev. E. R. Miller.
J. C. Hall, Esq.	J. Milne, Esq.
Dr. J. C. Hepburn.	R. Yatabe, Esq.

The meeting then adjourned.

ASIATIC SOCIETY *in account with* J. M. DIXON.

1885.	Dr.		1885.	Cr.	
June 23.	To Corresponding Secretary for current expenses	$20.00	June 5.	Balance from last year	$639.02
July 2.	" Manager *Japan Mail* for printing	9.50	Oct. 1.	Donation of M. Ph. Burty	36.76
Oct. 20.	" Plate for Dr. Whitney's paper	9.00	1886.		
Nov. 1.	" R. Meiklejohn & Co. for printing Vol. XII., part 4	475.11	Jan. 6.	Sale of Transactions through Maruya & Co.	46.50
1886.			Mar. 6.	Sale of Transactions through Corresponding Secretary	18.03
Jan. 6.	" R. Meiklejohn & Co. for general printing.	104.15	Mar. 11.	Sale of Transactions through Treasurer	8.40
Mar. 6.	" R. Meiklejohn & Co. for printing Vol. XIII., part 1	201.95	Mar. 24.	Sale of Transactions through Treasurer	2.80
Mar. 6.	" Treasurer for current expenses	5.34	June 1.	Sale of Transactions through Corresponding Secretary	88.00
Mar. 22.	" *Japan Mail* for alteration in Rules	3.00	June 9.	Sale of Transactions through Corresponding Secretary	1.75
Mar. 22.	" Corresponding Secretary for current expenses	53.48	June 12.	By Subscriptions of Resident Members:—	
June 1.	" Recording Secretary for Tōkyō for current expenses	1.00		2 for 1882	10.00
June 9.	" R. Meiklejohn & Co. for printing Vol. XIII., part 2	182.75		3 for 1883	15.00
June 13.	" Rent of rooms for the year 1885-6	100.00		5 for 1884	25.00
June 13.	" Balance in cash	282.66		25 for 1885	125.00
June 13.	" Balance in Old Oriental Bank Corporation	43.32		60 for 1886	300.00
	Total	$1,491.26		Non-Resident Members:—	
				1 for 1881	3.00
				2 for 1882	6.00
				4 for 1883	12.00
				5 for 1884	15.00
				5 for 1885	15.00
				2 for 1886	6.00
			June 12.	Entrance Fees, 11	55.00
			June 12.	Life Subscriptions, 4	63.00
				Total	$1,491.26

LIST OF MEMBERS.

Honorary Members.

Rear-Admiral W. Arthur, c/o Messrs. Hallett & Co., Trafalgar Square, London.
Sir Rutherford Alcock, K.C.B.
Sir Thomas F. Wade, K.C.B.
Professor Geo. E. Day, U. S. A.
Professor W. D. Whitney, U. S. A.
Hon. Geo. P. Marsh, Rome.
A. W. Franks, British Museum.
Professor J. J. Rein, Marburg, Germany.
Baron A. Nordenskjöld, Stockholm.
Rev. E. W. Syle, D.D., Philadelphia, U. S. A.
Rev. Joseph Edkins, D.D., Peking.
H.E. Ernest M. Satow, C.M.G., Bangkok, Siam.

Amerman, C. H., New York City, U. S. A.
Amerman, Rev. Jas. L., 19 Tsukiji, Tōkyō.
Anderson, Dr. W., St. Thomas' Hospital, London.
Andrews, Rev. Walter, Church Missionary Society, Hakodate.
Aston, W. G., H. B. M.'s Consul-General, Söul, Korea.
Atkinson, B.SC., R. W., Cardiff, Wales.
Bachelor, J., Church Missionary Society, Hakodate.
Ballagh, J. C., 6 Tsukiji, Tōkyō.
Bickersteth, Right Reverend Bishop, Ōsaka.
Bigelow, Dr. W. S., 20 Suzuki cho, Surugadai, Tōkyō.
Bingham, Hon. J. A., Cadiz, Harrison Co., Ohio, U. S. A.
Bishop, Rev. C., 15 Tsukiji, Tōkyō.
Bonar, H., H. B. M.'s Consulate, Hyōgo.
Brandram, Rev. J. B., Nagasaki.
Brauns, Dr. D., Halle University, Germany.
Brinkley, B.A., Capt. Frank, 22 Iida machi, Tōkyō.
Brooke, J. H., 28 Yokohama.

Brown, A. R., Marine Board, Tōkyō.
Brown, Matthew, Jr., 6 Yokohama.
Burty, Ph., 11 bis, Boulevard des Batignolles, Paris.
Center, Alex., 4-A Yokohama.
Chamberlain, B. H., Imperial University, Tōkyō.
Cocking, Jr., S., 55 Yokohama.
Conder, J., Government Architect, Tōkyō.
Cooper, B.A., LL.B., C. J., Bromwich Grange, Worcester, England.
Coughtrie, J. B., Hongkong.
Cox, W. Douglas, Imperial University, Tōkyō.
Cutler, Thos., Queen's Square, Bloomsbury, London.
Cruickshank, W. J., 35 Yokohama.
Dautremer, J., French Legation, Tōkyō.
Davisson, Rev. W. E., 221 Bluff, Yokohama.
Dening, Walter, 18 Suzuki cho, Surugadai, Tōkyō.
Dickins, F. V., University of London, Burlington House, London.
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ON THE TENETS OF THE SHINSHIU OR 'TRUE SECT' OF BUDDHISTS.

BY JAMES TROUP.

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An account of the development in Japan of the doctrine of the Pure Land, or Paradise of Amitâbha Buddha, — the central doctrine of the Shinshiu,—ought properly to commence with an enquiry into this doctrine as held by priests of the Tendai Sect, and others, who were the first to follow it in this country, and who in their turn derived it from the Chinese schools. Thereafter, the foundation, in the latter part of the twelfth century, by Genku, otherwise known as Hōnen Shōnin, of the Jōdo Sect, would come to be treated of; and, finally, the establishment, by the well-known Shinran Shōnin, in the earlier part of the thirteenth century, of the Jōdo Shinshiu, now known simply as the Shinshiu, or 'True Sect.' As a fragment, however, giving a limited view of this doctrine and the others that hinge on it, as at present held by the last-mentioned Sect, the following, it is hoped, may not be devoid of interest.

A pamphlet entitled *Shin Skiu Kio Shi* (眞宗教旨), or, A Synopsis of the Doctrines of the 'True Sect,' issued in December, 1876, by the Department of Instruction of the Eastern Hongwanji, and, as is stated on the first page, drawn up by the Compilation Department of that Temple, may, coming from that source, doubtless be taken as fairly representing what this important and active Sect wish to be considered their tenets. The following paper is an attempt at a summary, and, partly, a translation of the portion of this pamphlet which would appear to be the most interesting, and the purport of which the present writer conceives he has apprehended.

In the First Section of the pamphlet are enumerated the Seven who are reckoned Patriarchs by this Sect. They are Riujiu Bosatsu (*Nâgârjuna*), Tenjin Bosatsu (*Vasubandhu*) Donran Daishi (*Than-luan*), Dōjaku Zenshi (*Tao-ch'o*), Zendo Daishi (*Shan-tao*), Genshin Oshō (also called Ye-shin), and Genku Daishi (Hōnen). The reasons why these are reckoned as the Patriarchs are set out, severally, under each. Their claims to this rank are, for the most part, based on their writings,—those parts only of their writings being held in the highest estimation, by the Sect, which refer to the doctrine of the Pure Land and the worship of Amida (*Amitâbha*) Buddha. As the details of this section are generally coincident with although not so full as the sketch of the history of this Sect, from the pen of Mr. Bunyiu Nanjio, given in the *Anecdota Oxoniensia*, Aryan Series, Vol. I, Part II, edited by Max Müller, they need not be repeated here. The Section concludes :—"Now the substance of the doctrine "of the Seven Patriarchs consists in the calling of Bud-"dha to remembrance. As far as they treat, by the way, "of other matters, they then have reference to the means "of salvation by one's own power,—the method of the "Holy Path." The distinction between the method of salvation of the Holy Path—by one's own power, — and that of the Pure Land,—by the power of Another,—will be brought out more clearly further on. The opportuneness, in these Latter Days of the teaching of the Patriarchs relative to the method of the salvation of the Pure Land, by the Power of Another, would appear to be what is indicated in the last sentence : — "Kukai (i. e. Kōbō "Daishi) has said :—The wise man keeps silent; he who "awaits his opportunity, who awaits his audience, is such."

The Second Section is entitled, The Transmission (or Dissemination) of the Law (Light), and proceeds :—"There "are fourteen sects in Japan, viz.:—the Ku-sha-shiu, Jō-"jitsu-shiu (Jisshiu), Risshiu, Hossō-shiu San-ron-shiu, Ke-"gon-shiu, Tendai-shiu, Shin-gon-shiu, Zen-shiu, Dai-nem-"butsu-shiu, Jō-do-shiu, Ji-shiu, and Nichiren-shiu. Our "sect is called the Jōdo Shinshiu. The expression 'Nem-"'butsu' (calling Buddha to remembrance, or repeating "the name of Buddha), 'Jō-Butsu' (attaining Buddhahood), "are in consonance with the language of the Shinshiu. "Shinran Shōnin is considered the Founder of the Sect.

"The Shōnin was a descendant of the Tai-shoku-kwan "(Minister) Prince Kamataru, and son of Prince Fujiwara "no Arinori. The lady, his wife, Tama-hi, was the "daughter of the Sessho Kwambaku (Regent) Prince "Kamezane. First, Genku Daishi established the Jō-do "Sect. It spread abroad within the seas. The number "of his disciples exceeded three hundred. The Shōnin "truly became his most distinguished pupil. The Regent "turned to the Daishi. He became his great benefactor. "One day he said:—'[You] Daishi 'observe the Pro-"hibitions while calling Buddha to remembrance. 'Your "disciple eats (i.e. I eat) flesh and lives with a wife. Is "there no 'distinction of excellent and base in this?' "The Daishi replied:—'All equally call Buddha to re-"membrance. What fault is there in 'this?' The other "said:—'Your disciple has (i.e. I have) a 'daughter; let "'your chief follower condescend to become my son-in-"'law, and thus remove all doubt for future ages in the "'Empire.' The Daishi proposed this to the Shōnin; "the Shōnin declined; the other would not listen [to his "refusal]. This was the circumstance which brought "about the founding of the Sect.

"The line of the Law being in the line of the blood, "its custodians have succeeded each other now for six "hundred years. Gon-nio[1] Shōnin is actually the des-"cendant, in the twenty-second generation, of the Foun-"der. Of brilliant natural endowments, he has promoted "ability and encouraged learning. He has extended [his "influence] a hundred-fold; within the Seas he is only "less conspicuous than the mountain Tai and the North "Star. In the fifth year of Meiji (1872) His Present "Majesty issued a decree making him the Primate of "Religion; in rank he is the first of those of the black "garments throughout the whole country. The [next] "Heir of the Law Gen-nio[2] Shōnin, has been further "selected to be the Sub-Primate of Religion. He has "travelled into India, and looked on the mountains of "Rio-ga" (*Lankā*, i.e. Ceylon).

Section Third is entitled, "The Divisions of Doctrine", and may be rendered thus:—"The Doctrine of

1. Gon-nio Shōnin.—the present Chief Priest of the Eastern Hongwanji. (1885).
2. Gen-nio Shōnin,—his son.

"the Life [of *Sakyâ*] is divided according to two bodies, "(or orders) the Shōdō-mon and the Jōdo-mon (they of "the Holy Path and they of the Pure Land). [The dis- "tinctions of] the Greater Vehicle and the Lesser Vehicle,[3] "the 'partial' and the 'complete,' the 'temporary' and "the 'true',[4] the "'apparent' and the 'hidden'[5] apper- "tain to the Shōdō-mon. These relate to the doctrine of "entering on the Holy Path in this world. The *Dai-* "*mu-riō-jiu-kiō* (*Amitayus Sutra*, Larger *Suchavâtî Vyuhâ*)

3. The *Mahâyâna* and *Hinayâna*.

4. The 'partial,' and the 'complete,' the 'temporary,' and the 'true.' These expressions are explained as referring back to subdivisions of the Mahâyâna school or doctrine, and doubtless were terms in use from the earlier centuries of Buddhism; but the writer has been enabled to find that they, and those referred to under the next note, have all been identified. The expressions 'partial' (半) and 'complete' (滿), abridgments of 半字敎 and 滿字敎, the 二字敎 or 'two doctrines' taught by Bôdhi Ruchi (A.D. 503–535), are explained as signifying 'unfinished meaning,' or imperfectly developed doctrine, and 'clear meaning,' or complete doctrine (*ardha akshara* and *pûrna akshara*).

The term 'temporary,' (權) is explained by 'means,' or devices used towards an end, as opposed to the 'true' (實) or real. The 'temporary' includes the doctrines of the Hossō and Sanron Sects, which are therefore called the 'Temporary' Greater Vehicle; the 'true,' including the doctrines of the Kegon, Tendai, Shingon, and Zen Sects, which are known therefore as the 'True' Greater Vehicle. The doctrine which Sâkya Buddha is represented as having taught, previous to his fiftieth year, is termed the 'partial,' or imperfectly developed, and is contained in the four Sutraa the 般若 (*Pradjânâ Pâramitâ Sûtra*), the 華嚴, the 阿含 (*Agama*), and the 方等; that which he is represented as having taught from his fiftieth year, the 'complete' doctrine, which is contained in the 法華 (*Saddharma Pundarîka Sûtra*,—the 'Lotus of the Good Law'), and the 涅盤 (*Nirvâna Sûtra*).

Most of the information contained in this and the following note the writer has received from high Japanese authority on this subject.

5. Explained as 'apparent doctrine' and hidden doctrine,'—the former including all the doctrines of the Mahâyâna school except that of the Shingon Sect, which alone is called the 'hidden' doctrine. According to another authority, however, there is reckoned a third doctrine, coming between the above two, viz., a traditional doctrine, of which the Zen Sect is the present representative in this country; and, by the same the Kegon and Tendai Sects are reckoned the special representatives of the 'apparent' doctrine.

The above four pairs of terms,—Greater and Lesser Vehicle,' 'partial' and 'complete,' 'temporary' and 'true,' 'apparent' and 'hidden,' are used not only by the Shinshiu, but by all the other schools also.

"*Kwan-mu-riō-jiu-kiō* (Sûtra of Meditation) and *Amida-*
"*kiō*, appertain to the Jōdo-mon. These relate to the
"doctrine of the salvation of (i. e. Birth into) the Pure
"Land."

The three Sûtras here mentioned, which together are known as the *Sam-bu-kiō*, constitute the Scriptures of this Sect. They are known shortly as the *Dai-kiō*, (Greater Sûtra,) *Kwan-giō*, (Sûtra of Meditation,) and *Sho-kio*, (Lesser Sûtra).

"Again, within the Shōdō-mon there are the methods (schools) of "'lengthwise going-out' and 'lengthwise pas-
"sing-over.' The Hossō and San-ron Sects belong to the
"school of 'lengthwise going-out;' the Ke-gon, Tendai,
"Shin-gon and Zen Sects belong to that of the 'lengthwise
"'passing-over.' In the Jōdo-mon there are the methods
"of 'crosswise going out,' and 'crosswise passing-over.'
"Salvation by various actions constitutes 'crosswise go-
"'ing-out.' This depends on the power of one's self.
"Salvation by remembrance of the Name of Buddha con-
"stitutes 'crosswise passing-over.' This depends on the
"Power of Another."

The expressions 'lengthwise' and 'crosswise,' 'going-'out, and 'passing-over'[6] are to be explained with reference to the methods employed to attain salvation, or deliverance from the Cycle of Birth and Death,—in other words, to reach Nirvâna,—and appear to be meant to indicate the comparative slowness or quickness of the me-

6. For further explanation of these terms the writer is indebted to high Japanese authority on this subject, already referred to. It is to the following effect:—

These four terms are known as the 'two pairs' (二雙) and 'four folds' or tiers (四重) and are used and explained by Shinran in his work called 愚禿鈔, as follows:—The 'lengthwise going-out' ('going-out along') is the attainment of Enlightenment after long practice, and perseverance, through many kalpas, in the way of holy men. The 'lengthwise passing-over' (stepping-over along') refers to Enlightenment in this life,—the attainment of Buddhahood in the present existence. The 'crosswise going-out' (going-out across') is the attainment of birth in a region where the state of beings is like that of that of those in the womb,—a borderland, or species of limbo, adjoining the Pure Land (*Sukhâvati*),—the imperfection of this birth being the result of carelessness and doubt. This, as will be seen in the next note, refers to the method of the Jōdo Sect. The 'crosswise passing-over' ('stepping-over across') is to go to be born in the true Land of *Amitâbha* according to his Original Vow. (See Note 14, p. 8.)

thods used. The former methods are slow and laborious, the latter more speedy,—the last being direct and complete. The first two may be taken to indicate ways of salvation by good works,—by the practice of the *Paramitas* or 'cardinal virtues,' moral and religious precepts and prohibitions. The third, without doubt, indicates the system of salvation by 'Faith by one's own power,' alluded to further on, under the ninth section,—a faith excited and kept alive by means of religious observances. The fourth, the surest and speediest method, is the way of salvation by dependence on the power of *Amitâbha Buddha*, —a salvation by faith only.[7]

The Fourth Section is entitled "The Three Times," or Periods, which term is explained as follows:—"There are "Three Times," or Periods of the Law. For the space of "five hundred years from the death of [Sâkya] Buddha is "the Period of the Right (lit. upright) Law. There then "exist the Doctrine, the Practice (lit. Action) and the Wit- "ness [of attainment]. After those five hundred years, "for the space of a thousand years, is the Period of the "Image Law.[8] There then exist the Doctrine and the "Practice (Action), but there is no Witness [of attainment.]

"After those fifteenth hundred years, for the space "of ten thousand years, is the Latter Day Law (Period "of the Law). The Doctrine exists, but without the "Practice and Witness. At present it is 2, 825 years "since the death of Buddha.[9] The inferior capacities of

7. The third method or school refers to the Jōdo-shiu, from which the Shin-shiu sprung, and which,—although coming under the classification of the Jōdo-mon, since it also holds the doctrine of the Pure Land, —is still reckoned, from the Shin-shiu point of view, as holding the doctrine of salvation by one's own power.

8. The conservation of religion by means of the use of images,— the 'Period of Image Worship.' See Beal, *Catena of Buddhist Scriptures*, p. 141, note, where reference is made to the passage in the '*Lotus*,' on which this doctrine of the Three Periods is founded. Eitel (*Hand-book*) explains the term as the Period of 'fanciful religion.' The passage in the present pamphlet seems to suggest that the expression may mean the 'Period of the *simulacrum* of religion,'—when the Right or True Law no longer existed, although the Doctrine and Practice which existed under the Period of the Right Law were still followed.

9. This would place the date of the death of Sâkya-muni Buddha as early as 949 B.C. The usual date according to Singalese authors is 543 B.C. Rhys Davids arrives at 412 B.C., as the most probable date; and Max Müller's calculations bring it to 477 B.C. See the latter's *Hibbert Lectures*, pp. 134-5, notes.

"men are dark; they cannot tread the Holy Path and "rise to perfection. This is the reason why the Shōdō-"mon does not prosper. It is forcing a law which can-"not be practised upon men who cannot practice it,—"like urging fowls to go into the water. How can this "be reasonable? But the Original Vow[10] of Amida "(*Amitâbha*) Buddha, passing through the three periods, "includes the five Class-of-beings-capable-of-hearing-the-"Law.[11] There is thus no time when the Law cannot be "practised, no men who cannot practice it. It is said in "the Sutra (in the Greater Sûtra):—There still remains "this Sûtra. It endures for a hundred years (*i.e.* for long "time). Even after the ten thousand years of the Latter "Days of the Law, it endures for a hundred years. Ten "thousand years! and much more! The Doctrine, en-"during through time, presents the means of Practice "(lit. Action) and thus the true Witness of the Jōdo-mon "(*i.e.* of them of the Pure Land) even now flourishes. "Having entered on the period of the Latter Days of the "Law, now to desire the Holy Path (Shōdō) is like wear-"ing fur garments in summer and linen in winter. How "can this be reasonable?"

It does not follow from this that the Shin-shiu condemns the methods of salvation by means of moral and religious actions, followed by the other sects, as being in themselves at variance with true Buddhistic teaching; but merely that this sect holds such methods to be inopportune and impossible in the present age of the world.

The Fifth Section proceeds to sum this up by stating the "Four Laws," or the "Fourfold Law," according to which salvation is now attainable. It says:—"The *Dai-*"*mu-riō-jiu-kiō* (Greater Sûtra) contains the true Doctrine; "calling to remembrance the Name is the true Practice "(Action). This is from the seventeenth Vow.[12] The "Threefold Heart (*i.e.* the Heart of sincerity, of faith and "joy, and having a longing for birth in the Pure Land)

10. The Original Vow. See note 14, under page 8, *post*.

11. That is, Men, Gods, *Srâvakas*, *Pratyêka Buddhas* and *Bodhisattvas*.

12. The 17th Vow:—"If, when I attain Buddhahood, the innume-"rable Buddhas of the worlds of the ten regions (universe) do not, with "sighs on every side, chant-and-praise My Name, then shall I not accept "Enlightenment.—(*Bodhai*)."

"is the true Belief. This is from the eighteenth Vow.[13] "Surely the time of death (the attainment of Nirvâna) is "the true Witness. This is from the eleventh Vow.[14] "Zendo Daishi has said:—'In the Teaching of Religion, "'(*i.e.* in the Doctrine,) the Name is the means used: all "'living beings, hearing, Believe and attain Salvation. "This is what is what is termed the Fourfold Law.[15]

In Sections Sixth and Seventh, which treat of the "Three vows"[16] and the "hidden", and "apparent" further developments of the subject are briefly alluded to, but as these involve references which cannot at present be followed up, they are here omitted.

Section Eighth is entitled the "Vow Name",—that is, the Name referred to in the Vow,—the Name of Him

13. The 18th Vow:—"If, when I attain Buddhahood, any of the "living beings of the ten regions who, with sincerity, having faith and "joy, and an ardent desire to be born into My Country, call [My Name] "to remembrance ten times, should not [then] be born there, I shall not "accept Enlightenment.—(*Bodhai*). But from this the five classes of "reprobates,[1] and revilers of the Right Law are excluded."

1. The five classes of reprobates are:—Parricides, matricides, they who incite the priesthood to quarrel, they who shed the blood of a Buddha, they who put to death an Arhat.

14. The 11th Vow:—"If, when I attain Buddhahood, the men and "Devas of My Country who dwell together do not reach Nirvâna, then "shall I not accept Enlightenment.—(*Bodhai*)."

The Three Vows here quoted are from the Greater Sûtra (Dai-muriō-jiu-kiō), and are respectively the 17th, 18th and 11th of the forty-eight vows made by the being called *Amitâbha* in a previous state of existence in respect of his determination to attain the rank of Buddha. These vows are frequently termed "*Hon-gwan*" (本願), "original vows," and the expression "original vow of Amida Buddha," at page 7, refers to this, or rather to the eighteenth of those "original vows." The same expression, "Hon-gwan," gives the name to the principal temples at Kiōto of the two main branches of the Shin-shiu, and, after them, to many temples throughout the country.

The eighteenth Vow is distinguished from the others as expressing the condition under which the salvation of the Pure Land should be attainable,—namely by calling to remembrance the name of Amitâbha. The other vows, generally, express the nature of which this Paradise was to be. The eighteenth vow being thus the one affecting men seeking this salvation, is sometimes called, *par excellence*, the Original Vow,—an expression which in this paper has sometimes been rendered simply 'the Vow.'

15. The Fourfold Law:—the Doctrine, the Name, Belief, Salvation,

16. The three vows. See note 14, *supra*.

who made the Vow,—and proceeds:—"For us unenlight-
"ened (laity?), if we desire to be born into Pure Land
"it is necessary to have Faith (lit. to put forth the Be-
"lieving Heart) by the Power of Another. If we desire
"to have Faith by the Power of Another, we must hear
"the Vow Name. If we desire to hear the Vow Name
"we must look to the good and wise (priesthood?). If
"we already have looked to the good and wise, heard
"the Vow Name and have a mind taking refuge in the
"behest[17] [of *Amitabha*], this is Faith by the Power of
"Another.

"At present are the Latter Days of the Law; it is
"difficult to keep in the Holy Path (*Shōdō*). They[18] live
"in great temples; they style themselves abbots. Ex-
"ternally they exhibit worth and goodness; internally
"they are full of covetousness and sordidness. They
"wear silks and satins; they sit on hair rugs luxuriously.
"Proudly they cultivate outward forms (lit. appearances);
"they delude men, they deceive themselves. How can
"such be called superior persons? They forsake the
"world (lit. leave home,—*i.e.* become mendicants,—enter
"the priesthood,) and are much more worldly than ever
"(lit. remain more at home than ever). Alas! They
"drink wine, they eat flesh. How can they be said to
"keep the Prohibitions[19] (*i.e.* the Buddhist Moral Precepts)?
"They love their wives, they love their children. What
"family affections do they forego? Being thus, they in-
"crease covetousness. How can they say they practice
"almsgiving?[20] If they are not employed at one thing,
"they are at another. How can they have leisure for
"meditation?[21] Of inordinate lust. greedy for gain, what
"Zeal[22] in the performance of religious duty do they
"possess? They envy the worthy, they revile the good.
"What Patience[23] do they possess? Certainly they have
"no knowledge[24] They cannot regulate their conduct

17. "Taking refuge in the behest of,"—relying on the help,—invoking the assistance of (*Amitâbha*).

18. *I.e.*, they who in these days profess to follow the Holy Path,—the priesthood of other sects.

19. *I.e.*, practice Morality (*Sîla*).
20. Almsgiving (*Dâna*).
21. Meditation (*Dhyâna*).
22. Zeal (*Vîrya*).
23. Patience (*Kshânti*).
24. Knowledge (*Prajña*).

"according to the truth. Thus at one time they are "courageous in the performance of religious duty; impe- "tuously they set about practising the Six *Paramitas*[25] "[but] they cannot continue. If they have not ability to "practice the Six *Paramitas*, it is certain they cannot "attain deliverance.

"Zendo has said:—'We are truly like this: unen- "'lightened we are subject to the evil of Birth and Death; "'for long kalpas we revolve, sinking and floating [in the "'sea of existence]; there seems no cause of escape.' "How incomprehensible! But He, Amida Buddha, long "kalpas ago putting forth a heart of great compassion, "planning through five kalpas, having accomplished the "long kalpas, perfected his Vow. He said:[26] 'If any "'living beings of the ten regions who, with sincerity, "'having faith and joy and an ardent desire to be born "'into My Country, call My Name to remembrance ten "'times,[27] should not [then] be born there, I shall not "'accept Enlightenment.—(*Bodhai*).' 'If 'there are any "' of the living beings of the ten regions',—be they house- "holders or houseless (i.e. laity, or mendicants who have "left their homes), breakers of the Prohibitions or without "(i.e. not having taken vows to observe) the Prohibitions, "—having wives or not having wives, having children or "not having children, whether or not drinking wine or "eating flesh, whether they be husbandmen or merchants, "—if only they put forth the Believing Heart and take "refuge in the behest of (invoke) Amida Buddha, they will "throw out the radiance of a Buddha. Such will attain "this:—waiting for the end of life, they will reach the "great Nirvâna. Is it not a boundless great compassion? "If you desire to acknowledge this mercy, you must "chant-and-praise the name of Buddha."

Section Ninth is entitled:—"The Believing Heart "Faith) by the "Power of Another,"[28] and continues:— "But although you fail in no wise to chant-and-praise the

25. "The six *Pâramitâs*, or cardinal virtues, the practice of which leads to the "other shore,"—all referred to in the previous sentences.

26. 18th Vow.

27. Or, say, 'concentrate their mind on Me.'

28. The expression, "Power of Another" (他力), would appear to have been used first by Douran. Previously, the expression used to denote a similar idea was, "The Power of the Vow" (願力).

"name of Buddha, [yet] you cannot be born into the true "Land-of-reward.[29] You must without fail put forth the "Believing Heart (i.e. have Faith), and thereafter can you "first attain so to be born. [And] although you put forth "the Believing Heart, [yet] by the Faith which is by one's "own power, you cannot be born into the true Land-of-"reward. You must without fail put forth the Believing "Heart which is by the Power of Another, and thereafter "can you attain so to be born (attain this salvation). The "putting forth of the Believing Heart by means of the "Power of Another is called the Believing Heart (Faith) "by the Power of Another. The Power of Buddha is the "'Power of Another.' Clearly to believe in the knowlege "(wisdom) of Buddha is the Believing Heart. The heart "which believes clearly in the knowledge of Buddha is "produced by the Power of Buddha: it is not put forth "'by one's self. For one's own heart to excite this is "'called the Believing Heart by one's own power.' The "heart is not strong; speedily it changes. It is like a "picture drawn on water. But the Believing Heart by "the Power of Another,—this recedes not from its strength: "it is like the diamond."

"The expression 'Believing Heart' is in the Vow "of Mida.[30] He said:—'With sincerity, faith and joy, "'and ardent desire to be born into My Country.' The "'union of these three[31] *Shiaka* (*Sâkya*) calls the Believing "Heart.' Tenjin (*Vasubandhu*) calls it the 'United stead-"fast) Heart.' Buddha confers this Heart; He bestows it "on all living beings. This is the Believing Heart by the "Power of Another. The Believing Heart is in the Name "of Mida. Zendo says:—'The expression *Namu*[32] is a "taking refuge in His behest' (or, 'an invocation of "Him'). It is said in the Patriarchs:—'To take refuge "in His behest' (or 'to invoke Him') is the Mandate "enounced by the Vow.' The Heart which takes refuge

29. The Land which Amitâbha attained to have as the recompense or result of his Vows.

30. Mida, a common contracted form of Amida.

31. These Three:—Sincerity (至心), Faith and Joy (信樂), and Ardent Desire for Birth (欲生) in the Pure Land.

32. '*Namu Amida*,'—the expression chanted in calling to remembrance the name of Amitâbha Buddha.

"in His behest (or, which invokes Him) is not produced "by one's self; it is produced by the command of Budd- "ha. Hence it is called the 'Believing Heart by the "Power of Another.'"

* * * *

"It is said in the Sûtra:—'To hear the Name [and] "rejoice with the Believing Heart.' For the Name..... "to enter the heart of living beings,—this constitutes the "Believing Heart. The Name and the Believing Heart "must be known to be one. As an illustration:—The "unenlightened heart is like unclean water; the Heart of "Buddha is like a pure Mani pearl.[33] If the Mani pearl "is put into the unclean water, the water changes and "becomes pure. If the Heart of Buddha enters the "unenlightened heart, the heart changes and becomes "believing."

The Section goes on to indicate that, where this believing heart, or Faith, exists, its existence will be declared by the Action of calling to remembrance, with the living voice, the name of Amida,—"as where there is fire there will certainly be smoke." The two together are termed the "Union of Faith and Action" (Practice). It further continues:—"Faith by one's own power cannot "afford rest to the heart. It is said:—'Shall I surely "attain salvation, or shall I not?' and thus what is called "faith is in reality doubt. Riujiu (*Nâgârjuna*) has said:— "'Where there is doubt the flower will not open.' Faith "by the Power of Another affords rest to the heart. It "is said:—'I am borne by the power of that Vow; I "shall certainly attain salvation.' There is not the small- "est doubt in the heart.

"Those who follow the method of 'self-power,' re- "peating the name of Buddha with a view to reward, act "with the object of attaining salvation. Those who fol- "low the method of 'Another's power,' show their grati- "tude by calling to remembrance the name of Buddha."

* * * *

"Those who follow the method of 'self-power' be- "lieve in other (many) Buddhas; those who follow the

33. *Mani* pearl,—one of the *Sapta Ratna*, or Seven Precious things,—a round pearl which is said to keep always clean and bright, etc.—See Eitel, *Handbook of Buddhism*, p. 72.

"method of 'Another's-power' believe only in [the] One[34] "Buddha,—as a faithful servant does not serve two mas- "ters. The 'self-power' belief is of nine (manifold) sorts; "the lands (regions) of birth [under it] are also nine "(manifold). In the Sûtra this is called birth by gene- "ration (natural birth). The "'Other's-power' belief is "of one kind and no other; the land of birth under it "is also One Boundless Bright Land. In the Sûtra this "is called the birth of Transformation."

The Tenth Section is termed "The Popular System," or "The System for the laity," in contradistinction to the True System," as expounded by the priesthood. The Popular System" has reference to the distinction of good and evil in conduct, in this world; the "True System" to that of belief and doubt in the mind, on which depends the salvation of the other world. This Section shows the practical application of the doctrines of the Sect in the various circumstances and relations of human life. It commences:—"The appellations 'true' and 'popular' "are an important matter. Our Sect terms the attaining "of the rest of the heart the True System; the observa- "tion of the relations of life the Popular System. Our "Sect has granted the permission to marry. Hence the "five relations of life exist, the duties involved in them "must be observed. This is termed the Popular System. "It is said in the Sûtra:—'The living beings of the ten "regions,—be they householders' or houseless' (i.e. laity "or *religieux*). Thus the Sovereign, who installs his Con- "sort, and partakes of the royal viands, attains salvation. "The commoner, who possesses a wife and eats flesh, [also] "attains salvation. Shall the Holy Poth be different for "them? Although the sins of the unenlightened be many, "if these are contrasted with the Power of the Vow they "are not as a millet seed to the ocean. The eating of flesh, "the having of wives are nothing to speak of. A stone "is by nature heavy; if you precipitate it into the water, "it inevitably sinks, [but] if you place it upon a ship, it

34. From the fact of this sect believing only in *One* Buddha, they are sometimes called the "I-kkō Shiu (一向宗).

35. The Five relationships of human life, viz.:—Husband and wife, father and son, brethren, prince and subject, friends,—according to the Chinese philosophy.

"assuredly floats. The sins of the unenlightened are "heavy; if you precipitate them on the Three Worlds,[36] "they inevitably sink; [but] if you place them on the "ship of the Vow, they assuredly become light. The me- "rit of living beings is full of leaks. Mida's Land-of-re- "ward has no leaks. With the merit which is full of "leaks, you cannot be born into the Land where there are "no leaks."

"Although our Sect does not set up Prohibitions and "Rules, yet it certainly regulates conduct according to the "relations of life. Hence, in it, faithful servants, filial "children, dutiful wives and true friends are numerous. "The foundation of the relations of life is set forth in the "Greater Sûtra. It is said:—'For a servant to betray "'his lord, for a child to deceive his father, for brothers "'and sisters, husbands and wives, wise or unwise (priest- "'hood or laity), to fail in their duty to each other,— "'these are the actions violating the relations of life "which the venerated Shiaka (*Sâkya*) has denounced.'

"Going out to battle and dying by arrow or stone,— "this is fidelity. Dying, to be born into the realm of "Bliss,—this is faith. One meritorious action, two advan- "tages. When the Nations are not silent about [their] "armies, we cannot ensure our safety without fighting. "If one attains faith now, then in the time of battle "also will it be well. In battle, for a man of faith to "face death is like being born. If we do not make the "voyage to foreign countries, we do not know their "characteristics; if we do not know their characteristics, "for protection in war we are at a disadvantage. If on "the ocean tempests arise, or one's life is endangered, if "he has already attained faith, then to die will it still be "well.

"The land which holds Buddha in remembrance as- "suredly the all-seeing Gods and the spells of Buddha "will protect. It is said in the Sûtra:—'The Empire in "tranquility, the Sun and Moon clear and bright; the "'wind and the rain observe their seasons, scourges and "'pestilences do not arise; the country fruitful, the

36. The Three Worlds of the Buddhist Universe, viz.:—the World of Desire (*Kama-loka*), the World of Forms (*Rupa-loka*), and the World of Abstraction, or, World without Forms (*Arupa-loka*).

" ' people in peace; the arms of the soldier are unused.'
" Is this not good reason for gratitude towards one's
" country ? [37]

" Men who hold Buddha in remembrance are assur-
" edly numerous in showing returns of gratitude to their
" Prince. It is said:—'He nourishes us in peace; 'calling
" ' Buddha to remembrance, he satisfies our wants; living
" ' or dying, we receive the favors of our Prince.'

" Our sect especially abhors dereliction of filial duty.
" It is said:—' To meet with hatred, with angry eyes, the
" ' admonitions of father and mother,'—and again:—' To
" ' be without a child is better than this.' Ren-shi (Ren-
" nio Shōnin) has said:—' Unfilialness is the head of all
" wickedness.'

" The nations render themselves illustrious by means
" of learning. By assiduous devotion to learning becom-
" ing one's self illustrious, to make others illustrious, this
" is what constitutes a dutiful son. Becoming learned and
" not caring for one's parents—to be without learning
" is better than this."

" [As to] the way of the husbandman, the artisan and
" the merchant, [each] tries to emulate the other in skill;
" [he says] shall I only be behind in good fortune? [Yet]
" while they press to the uttermost the strength of the
" soil, [or] examine into the nature of things, [and thus]
" even impose commands upon Nature, still must returns
" of gratitude be shown to parents."

Personal excesses are rebuked, as involving unfilial conduct, and the other family relations are then adverted to.

" Love between husband and wife arises naturally;
" but if it is not possessed along with the remembrance
" of the name of Buddha, that love is not complete.
" Those who call Buddha to remembrance are humbled
" (lit. ashamed) before Heaven, are humbled before the
" Gods; they do not diverge from the maintenance of
" fixed principles."

" It is said in the greater Sûtra:—' Sun and Moon
" ' shining behold, the all-seeing Gods take note; for what
" ' is done in the open light there is shame before Sun

37. "One's country" is synonymous with 'the Governing Powers', 'the Ruler.'

"'and Moon, for what is done in the shade there is "'shame before the Gods. How may we offend against "'propriety?'

"A husband loves his wife, therefore he causes his "wife to call Buddha to remembrance. The wife also "likewise [the husband]. [Thus] living they are good "son and daughter; dying they accompany each other "into the Land of Bliss. Is it not well?"

"An elder brother loves a young brother, a younger "brother respects an elder brother,—still in accordance "with the law of Heaven. But if they do not do so along "with the remembrance of the name of Buddha, differ- "ences between [the same] flesh and bone may be the "result. Quarrels between brethren arise from selfishness. "It is said:—'The good is for me, the bad go to the "other.' He who calls Buddha to remembrance considers "himself about to become a Buddha or Bodhisattva, and "thus, exerting his strength, he uproots selfishness; his "splendor is complete. It is said in the Sûtra of Medi- "tation:—'the Bright all-shining One receives (lit. com- "'prehends) and rejects not [all] the living beings of the "'ten regions who call Buddha to remembrance.' If "[therefore] you are already among those whom the "Bright One receives (comprehends) and rejects not, shall "you endanger an elder brother, shall you cause evil to "a younger brother?"

"It is said in the Patriarchs:—'Brothers within the "four seas.' Faith by the power of Another proceeds "from Mida. Thus Mida is Father and Mother; [all] "within the four seas are brothers. The Chinese call "foreigners barbarians; foreigners call Chinese uncivilized. "Both, we consider, are wrong.[38] Those who do not ob- "serve the relations of life are the barbarians, without "distinction of home and foreign. Throughout all that "the heaven covers, wherever sun and moon shine, what "is there that we shall call barbarian or uncivilized? "When the heart (mind) is [wide as] heaven and earth, "the discourse [clear as] sun and moon, then first is at- "tained the equitable and the just. Between heaven and

38. There is internal evidence in the pamphlet of its having been written with a view to a Chinese audience; about the time of its appearance there was a movement by the Shin-shiu leaders in the direction of propagandism in China.

"earth there is no one to be disassociated, no spot not "to be reached. The kindly relations of intercourse make "the friend. Two persons, the same mind; their spirit is "[as] disseparated gold. One country, the same mind; "[as] a golden bowl without defect. All countries, the "same mind; then first is attained the perfect equitabili-"ty. The foundation of the same mind is the calling to "remembrance of the One Buddha."

The section continues for a few sentences more in a similar strain, and the pamphlet concludes with the next section, which does no more than enumerate a number of various duties, which, the writer states, will be enlarged upon verbally in the assembly.

It is felt that some apology is due to the writer of the pamphlet for the imperfect manner in which his production has been presented here in an English dress.

I am indebted to the Rev. James Summers for valuable assistance in connection with the preparation of this paper.

THE ABACUS, IN ITS HISTORIC AND SCIENTIFIC ASPECTS.

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PART I.—THE HISTORIC ASPECT.

The *Soroban* (算盤) or Japanese Abacus is one of the first objects that strongly attracts the attention of the foreigner in Japan. He buys at some shop a few trifling articles and sums up the total cost in his own mind. But the tradesman deigns not to perplex himself by a process of mental arithmetic, however simple. He seizes his *Soroban*, prepares it by a tilt and a rattling sweep of his hand, makes a few rapid, clicking adjustments, and names the price. There seems to be a tradition amongst foreigners that the *Soroban* is called into requisition more especially at times when the tradesman is meditating imposition; and in many cases it is certain that the Western mind, with its power of mental addition, regards the manipulator with a slight contempt. A little experience, however, should tend to transform this contempt into admiration. For it may be safely asserted that even in the simplest of all arithmetical operations the *Soroban* possesses distinct advantages over the mental or figuring process. In a competition in simple addition between a "Lightning Calculator," and accurate and rapid accountant, and an ordinary Japanese small tradesman, the Japanese with his *Soroban* would easily carry off the palm. It is true that the Japanese often uses his board and beads when the operation is simple enough to be completed mentally during the time that he stretches his hand out to take hold of his instrument; but that is only

an illustration of the irresistible force of habit. To him the mention of any arithmetical operation suggests "Soroban." He could no doubt, if he tried, add 12 and 13 in his mind; but before he has time to recognise the peculiar simplicity of any special problem, and, dispossessing his thought of "Soroban," proceed to solve it as the foreigner does, he would waste more time in mental labour than is expended in the manual labour of adjusting and manipulating his counters. The only blame indeed that can be attached to him for using his instrument to add 5 to 8 is that he is strictly consistent. But let us suppose that a purchaser has bought three articles which are priced at Yen 1.25, Yen 2,89, and Yen 3.17 respectively. How many people out of any hundred of ordinary intellect could add these three numbers correctly in their mind? A Japanese shop-boy with *Soroban* in hand will do it as fast as the numbers can be named, and with greater precision and certainty than many of us could attain in figuring. Facts like these suffice to give to the instrument a certain respectability.

The Abacus possesses besides a high respectability, arising from its great age, its wide-spread distribution, and its peculiar influence in the evolution of our modern system of arithmetic. In the Western lands of to-day it is used only in infant schools, and is intended to initiate the infant mind into the first mysteries of numbers. The child, if he ever is taught by its means, soon passes from this bead-counting to the slate and slate pencil. He learns our Indian Numerals, of which *one* only is at all suggestive of its meaning; and with these symbols he ever after makes all his calculations. In India and all over civilized Asia, however, the Abacus still hold its own; and in China and Japan the method of using it is peculiarly scientific. It seems pretty certain that its original home was India, whence it spread westward to Europe and eastward to China, assuming various forms, no doubt, but still remaining essentially the same instrument. Its decay in Europe can be traced to the gradual introduction and perfecting of the modern cipher system of notation, which again in part owes its early origin to the indications of the Abacus itself. According to the results arrived at by Sir E. Clive Bayley, in his discussion of the genealogy of

modern numerals,[1] the main facts seem to be these. The Abacus finds its earliest historic home in India, where originally it existed alongside of most complicated systems of numerical notation. The gradual simplification of these in accordance with the universal tendency of the human mind under civilisation—a simplification which largely consists in borrowing from elsewhere—brought them into closer and closer correspondence with the indications of the Abacus. At last with the evolution of the *zero*, the notation became accurately symbolic of the columns of the Abacus, and rapid calculation was possible without their aid. In Europe the new system, introduced through the Arabs, gradually displaced whatever "counter" system was in vogue. But the substitution of the symbolic for the mechanical was only partial in India, while in China and Japan centuries have been insufficient to effect the change. These facts are sufficient to show that the ciphering system is not so very superior to the Abacus as we of western training are apt at first to imagine. That the Chinese and Japanese should still use an instrument, which to us is suggestive of an infant school, is startling. To explain it as a result of the general conservatism of the eastern mind is nothing to the point; for not only has the conservatism itself to be explained, but we have in the non-conservative character of the Japanese mind a fact that cannot be disregarded. I think the true explanation is to be found in the processes of natural selection which of course vary with the mental habit of the race. The problem is twofold, What causes, not present in the East, led to the ascendency of ciphering over bead-counting in the West; and do these causes imply any difference in the mental attitudes of the peoples? It is convenient to discuss these questions under two heads.

First I shall consider comparatively the systems of numerical notation that have been invented amongst civilised peoples, and then proceed to compare the systems of numeration or nomenclature of numbers. I have placed notation first, not because of any logical necessity, but because of its greater simplicity. Speaking of course precedes writing; but that hardly implies that numerical

1. Journal R. A. S., vols. xiv, xv, xvi.

notation necessarily succeeds number-naming. It is quite conceivable that man should have indicated a number graphically or pictorially before he had a name for it. We often hear of the savage who cannot *number* beyond two or three or five, which usually means that he has no names for numbers above that limit. But to infer that he cannot reckon beyond that limit is certainly illogical. The remark made by a native to Dr. Koelle,[2] at the time missionary in Sierra Leone, is quite to the point here. Dr. Koelle expressed surprise that they should be able to do in daily life with numerals only to the limit of five, to which one replied:—"We can manage very well; for having counted five, we put it aside on one heap and then begin another, and so on, as many as we want." The same is found amongst the native of the New Hebrides, who count off by bundles of ten, and use the same word for forty as for four, making up by gesture for lack of language and a moment's thought will show that we ourselves do exactly the same, only that we give *names* to our bundles of ten, a result probably of the development of writing. Notation indeed has quite outstripped nomenclature; and nomenclature itself may ultimately depend upon notation, used in its widest sense of pictorial symbolising. To this point we shall return later.

The graphic representation of numbers may be traced historically through four well-marked stages, which I shall call for ease of reference the Pictorial, the Symbolic (including the Alphabetic), the Decimal and the Cipher stages. These names are not to be taken in too literal a sense; and we must remember that in many classifications it is difficult exactly to draw the lines of demarcation between the classes—each one partaking more or less of the special characteristics of the others. Thus we have Pictorial numerals up to four in the Roman system, and to three in the Chinese; but the Roman belongs distinctly to the Symbolic stage, and the Chinese to the Decimal. In a loose sense the term Decimal applies to both Symbolic and Cipher systems; but here it is, for the sake of greater definiteness, restricted to those systems which have a distinct symbol for *ten* and repeat it in the higher numbers.

2. Journal R. A. S., vol. xvi.

It may be stated at once that there are no examples amongst civilised nations of a purely Pictorial System. In the early Egyptian Hieroglyphics, *one* was represented by a vertical or (more rarely) a horizontal, line; and by repetitions of this, the other numbers were figured up to *nine*. Such a system, however, could hardly be carried much further without giving rise to confusion. Even the *eight* (𓏼𓏼𓏼𓏼) and *nine* (𓏼𓏼𓏼𓏼𓏼) would be apt to be mistaken for each other; and higher combinations of course still more so. Also, as writing became more widely used, a necessity arose for shortened processes. Hence, as a result of the desire to save time and prevent misunderstanding, a peculiar symbol for *ten* was evolved in shape somewhat resembling a croquet hoop. This symbol was then used in obvious pictorial combinations to represent 20, 30, 40, etc., up to 90. With the aid of these two symbols numbers up to 99 were figured. Higher numbers were represented with the aid of other peculiar symbols for 100, 1000, 10,000. Thus with only four non-pictorial symbols, which were probably evolved from pictorial combinations, the early Egyptian could figure numbers up to 99,999. In later inscriptions, however, the symbolic methods gradually creep in. Thus *five* is represented by a five-rayed star, *six* by the star and a stroke, *seven* by the star and two strokes. This star may be meant to symbolise a spread-out hand. or it may have an astronomical reference to the 5 planets which, with the sun and moon, formed the seven divine luminaries. Less obvious symbols appear later for *seven*, *eight* and *nine*; and peculiar forms also seem to have been evolved for the various *tens*. Turning now to the Cuneiform inscriptions, we meet with a system very similar in its broad outlines to the early Egyptian Pictorial. The numbers up to *nine* are represented each by the number of the simple wedge-shaped character. *Ten* is symbolised by the angle-shaped character, two of which give 20, three 30, four 40, and five 50. *Sixty*, however, is represented by the same simple character as one, to which ten is added to make 70, and two tens to make 80, and so on. Amongst the old Accadians this mode of numeration was continued throughout, numbers being written, and perhaps named, in the Sexagonical scale. Thus the expression,

 2,36,21, means

$2 \times 60 \times 60 + 36 \times 60 + 21 = 9381$. Amongst the Assyrians, again, a distinct symbol, compounded of the unit and a small horizontal wedge following, was used for a hundred, and a prefixed ten gave the thousand. For example the Assyrians would write the above number.

The Persians in their Cuneiform inscriptions seem to have banished all trace of the sexagesimal scale. Certainly the substitution in whole or in part of the denary for the sexagesimal scale marks an advance towards simplification. For many purposes, however, this seemingly awkward sexagesimal scale was really convenient; and not only did the Assyrians, and much later the Alexandrian astronomers, use it in the expression of fractions, but it survives to this day in the graduation of the circle and in the subdivision of hours and minutes. Its origin was probably astronomical. The Accadians seem to have attained a high civilisation, and there is no doubt that in writing their numbers they had clearly grasped the idea of "place" as giving value to a sign. The Assyrian modification is from this point of view a retrogression, and not until we come to the cipher notation do we return to the scientific method of the ancient and almost mythical Accadians. These examples from the Hieroglyphic and Cuneiform modes of writing are for the lower numbers strictly Pictorial. For the expression of the higher numbers, the necessity for the Symbolic soon arose; while in the most ancient of all we have not merely the germ of "place-value," which is the peculiar pride of our cipher system, but the very thing itself.

In the old mathematical treatises of the Chinese another system of notation, largely pictorial, is met with. This notation is extremely cumbrous, and has all the appearance of having been invented in the first instance as a visual representation of the Abacus columns. Up to five, the numbers are represented by the requisite number of vertical strokes as in the other pictorial systems. *Six* is represented by a T-shaped character, and the higher

numbers up to ten by the obvious addition of vertical strokes below the horizontal line, so that *eight* has the appearance of a set of wickets at cricket, with a fourth wicket laid across the tops instead of bails. *Ten* is figured by a horizontal stroke, with a circle or cipher at the right-hand end. The successive "teens" are obtained by replacing this circle by the proper digit symbol. Twenty is two horizontal strokes, one above the other; thirty, three—and so on to sixty, which is a horizontal stroke with a vertical drawn above it. Thus *sixty* is simply *six* turned upside down; while *eleven* is the same T-shaped symbol turned on its side. There can be little doubt, I think that this system, with its convention between the meaning of isolated vertical and isolated horizontal strokes, or between six and sixty, seven and seventy, and so on, grew out of an attempt to depict in some convenient manner the indications of the Chinese form of abacus. The hundreds are a repetition simply of the units, the the thousand of the tens, and so in alternation—any blank abacus rod being represented by the circle or cipher. Thus the number 527,068 is figured

The conclusion that this is but an abacus product is borne out strongly by two considerations, namely, the particular mode of representing the 7, 8, 9 in the tens, thousands, hundreds of thousands denominations; and the manner of writing from left to right, so incompatible with the general tendency of Chinese writing. As will be seen later, this latter peculiarity will be adduced as evidence that the abacus was imported into China from the west. The use of the circle in a limited cipher significance is also of historic interest. There is no *a priori* reason for employing such a form of character to represent an empty rod on the abacus, so that it is hardly possible that two distinct races should have invented the same symbol. The probability rather is that the Chinese adopted this symbol from the Indians, among whom, according to Sir E. C. Bayley's researches, it developed from a symbolic form of ten.[3] It appears then that the Chinese pictorial

3. In some Chinese treatises a cross or X-shaped character is used for "four"—a form of character which is met with in the Bactrian and

system is rather a retrogression than a progression in the history of arithmetic, being a cumbrous and somewhat childish figuring of the abacus indications.

We now pass to the symbolic stage, in which are included many widely diverse systems, their only common feature being the existence of distinct symbols for 20, 30, 40 and so on. The development of these various symbols is coëval with that of alphabets and syllabaries, and of civilisation generally. Nearly all the alphabets of the world have been traced through the early Phœnician to the final semi-alphabetic forms of the Egyptian Hieroglyphics. Even the numerous alphabets found all over Central and Southern Asia and in the Islands of the Eastern Archipelago, are believed to be descendants, through the old Magadhi alphabet of India, of the same great original. The numerals have certainly followed a similar course. Already in the Accadian Cuneiform and and the Egyptian Hieroglyphics a few distinct symbols have crept in, invented obviously to save time in writing. With the growing need for more rapid writing, symbols continued to be invented or perhaps more strictly, evolved from the original Pictorial representation. Now there is not the least doubt that there is a great conservative momentum in the mind of man. Even in these days of enlightenment and progress, the intensely practical Briton spells as if he knew not how he spoke; and the philosophic German says there are "three hundred five and sixty" days in the year! And the same mental habit of man is shown in his number-writing. The Accadians, by a wonderful generalization, had grasped the idea of "place-value"; but the system was necessarily cumbrous with *sixty* instead of *ten* as the notation unit. Their successors only partially took up the sexagesimal notation: and the idea of "place" was quite lost sight of with the introduction of the Decimal division of numbers. The Egyptians, again, never seem to have attained anything like the mathematical grasp of the Accadians; and, as a necessity, they found their solution of the problem, how to write numbers, in a multiplicity of symbols. A con-

other old Indian numerals where it has exactly the same significance. This is another strong argument for the Indian origin of the Chinese arithmetic.

sideration of the Hieratic numerals will show clearly the nature of what is here called the Symbolic stage. (See Plate 1.) Not only are there distinct signs for the units up to nine, but the successive decades and hundreds are provided with peculiar symbols also. Sometimes one of a series is clearly a modification of one of its predecessors, as for example 20 of 10, 80 of 60, and the successive hundreds. This indicates one mode by which man invented his numerical symbols. The numerals of the Gupta Inscriptions and of the Maldive Islands, and the older Devanagari and the modern Cinghalese systems may be grouped, along with a number of ancient Indian systems, as of similar structure with the Hieratic. Several influences were at work in the formation of these symbolic systems, all of which seem traceable to the same ultimate source. One race would borrow from another, perhaps taking a symbol and applying it to a different number. Or the symbols might have phonetic values and be strung together to form a word or phrase of mnemonic value. Or the alphabetic or syllabaric symbol might be used which corresponds to the first letter or syllable of the name as spoken; as for example the Roman C. and M. With all these possible modes at the disposal of man, it is little wonder that in his inventive exuberance he should have evolved such a multiplicity of symbols. Whatever symbol became popular did so by a kind of natural selection. In making this selection, however, the hereditary tendency of man's mind was an important factor, and the principle of conservative momentum would certainly make itself felt, so that development would take place along the lines already laid down. At the same time, it would all be by way of simplification. To use initial letters when possible was a very obvious method, which we meet with in the early Greek and in the Ethiopic systems. From such a system would spring very naturally the idea of using the alphabet for the successive numbers—indeed there may have been a kind of mutual adjustment of the numeral series and the alphabet series. In this way the Hebrew and later Greek numerals became formed, and other alphabetic systems, such as the Georgian, Armenian, and older Turkish and Arabic. The Greeks borrowed their system from a people with a similar but fuller alphabet, as is shown by the fact that

they had to throw in a special non-alphabetic symbol for six. Their special symbols for 90 and 900 were probably later introductions, to eke out the characters to the necessary twenty-seven. The Roman system, which is largely symbolic, is too well known to require special mention. Now of all these symbolic systems of numerals, the Greek alone was capable of being used for calculation. The thousands were the units repeated with a suffixed "dash"; but the calculator could omit the "dash" without fear of confusion. For the expression of higher numbers, octad and tetrad combinations were employed, much as we nowadays tick off our large numbers in groups of threes. Here the Greek came in contact with the principle of "place value," but was still far behind the ancient Accadian.

The defect of the symbolic systems for calculating purposes was not, however, felt by their users; for they had the Abacus and like instruments, which were sufficient for their needs. The earliest form of abacus was a simple board covered with fine sand or dust. This surface was ruled into columns, which served for the different numerical denominations, the units, the tens, the hundreds, etc. In the columns thus made the numbers were marked by strokes or symbols. Latterly the sand was dispensed with, and pebbles (*calculi*) or counters were used on boards ruled into permanent columns. In another form, the counters were placed on lines as we place our "men" in backgammon. Still another form was the combination of rods and beads familiar to us all in the special modification of it called the *soroban*. If we could pass back to pre-abacus days, we should probably find our ancestors counting by bundles of ten or twenty, as savage races do now. From this mode of reckoning, the table of columns or abacus would be a very natural development. It has been already pointed out that the abacus has all the marks of great antiquity, so that its evolution is probably coëval with that of the numerals. Each numeral was essentially a shorthand expression for the idea or the name, and was a conception distinct from that of calculation. Hence it is little wonder that the numerals and abacus developed along perfectly distinct lines; and long before the numerals had passed from their symbolic stage amongst the early Indians or later Greeks, the

abacus had atttained its highest perfection. On the abacus the "place-value" of number was recognized—indeed could not be mistaken; and yet, if we except the Greek notation of tetrads and the cumbrous Chinese pictorial symbols, nothing corresponding to this had been evolved in numerals. In fact, so far, numerals were used as ideographs, not as arithmetical symbols.

The abacus may have had an influence in accelerating the transition to the next stage—a transition which seems to have taken place in India and in China only. This stage, which I have called the Decimal, is marked by the elimination of the special symbols of 20, 30, 40, etc., up to 90, which are henceforth written as "two-ten," "three-ten," "four-ten" and so on. The Chinese numerals give a very perfect example of the system, which is also found amongst the Tamils. They are shown in Plate I.[4] By whatever means and through whatever intermediate forms this great simplification was made, it signified a firmer grasp altogether of the nature of numbers. The symbol *ten*, in fact, is used in a new and quite conventional signification in these combinations. For example compare the 十三 (13) and 三十 (30). The former means ten (and) three, the latter three ten's, or *ten three-d.* In fact, in 三十 the 十 becomes a denominatiou rather than a number. The convention then for differentiating 十 in its two meanings is as follows: When 十 follows a number it is to be repeated that number of times; but when it precedes a number is to be added. Such a symbol as 十十 could mean either *two tens* (precisely as in the original pictorial method) or *ten ten-ned* that is, 100. The Decimal method, however, stops here, and introduces a distinct symbol for 100 (namely 百), another for 1000, and so on. We shall give here the successive Chinese symbols, with the modern Japanese pronunciation of their names as being more familiar to our readers than the original Chinese pronunciation.

百	*hyaku*	=	100	or	10^2
千	*sen*	=	1000	or	10^3
萬	*man*	=	10,000	or	10^4

4. The Chinese symbols are of course written vertically, but for convenience in the text we shall write them from left to right.

The next three stages in powers of ten are called *jū-man*, *hyaku-man*, *sen-man*, and are so writen. Thereafter the new symbols go by ascents of 10,000.[5] They are as follows:

億	*oku*	(10^{8})	溝	*ko*	(10^{32})
兆	*chō*	(10^{12})	澗	*kan*	(10^{36})
京	*kyō*	(10^{16})	正	*sei*	(10^{40})
垓	*gai*	(10^{20})	載	*sai*	(10^{44})
秭	*shi*	(10^{24})	極	*kyoku*	(10^{48})
穰	*jō*	(10^{28})			

There are also terms for the decimal places as far as the 12th. These are:

分	*Bun*	10^{-1}	纖	*Sen*	10^{-7}
釐	*Rin*	10^{-2}	沙	*Sha*	10^{-8}
毫	*Mō*	10^{-3}	塵	*Jin*	10^{-9}
絲	*Shi*	10^{-4}	埃	*Ai*	10^{-10}
忽	*Kotsu*	10^{-6}	渺	*Byō*	10^{-11}
微	*Bi*	10^{-6}	漠	*Baku*	10^{-12}

The ideographs for these words have many of them very suggestive meanings. Thus the character for *Sen* means silk thread; for *Sha*, sand; for *Jin* and *Ai*, small dust; for *Byō* and *Baku*, hazy, cloudless aspect of the sky. Excepting the first three, however, which are common, these terms are rarely used outside the covers of the mathematical treatise.

The Tamil and Malayalam numerals follow closely the same course, and the process has to a certain extent appeared in the Cinghalese system, which may therefore be regarded as marking a stage during the simplification from the symbolic.

The peculiarities which distinguish the Decimal from our own Cipher or Indian system are apparent from the following comparative tables:

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5. Such, at least, is the custom amongst the educated Japanese of the present era. The usual dictionary meanings of *oku* and *chō* are not the same as those given here; indeed the words seem to have been used more or less vaguely in former times in much the same way as Europeans use *billion*, *trillion*, etc. One authority gives three modes of progression; namely, ascent by *tens*, ascent by *ten-thousands*, ascent by *successive squarings*. The terms above *chō* are rarely used.

Chinese	一	四	十	十四	四十	四十一	四百四十一
Indian	1	4	10	14	40	41	441

The transition from the Decimal or Chinese system to the Cipher system is such an obvious one, especially with the abacus columns in full view and in daily use, that our surprise is, not that the Indians of some 2,000 years ago should have made the step, but that the Chinese or Japanese should not. Here are two highly intelligent races possessed of a convenient arithmometre and of a system of number-writing which can be called a notation, and which in some respects approximates to the visual representation on their instrument. The one race brings the notation and Abacus into perfect accord, and begins the era of true science; the other makes no advance whatever, and even scorns to accept the perfected system, with which it has been face to face for centuries. It may be said, as M. Woepcke[6] said of the Greek mathematicians, that with the Abacus in hand, the Chinese and Japanese did not feel the want of a Cipher system. But if the theory is true that our Cipher system passed through the Decimal stage amongst a people who used the Abacus in a form exactly similar to the Chinese instrument, the argument ceases to have any great point. Woepcke's remark was made in his rather laboured attempt to explain why our numerals, given to us by the Arabs, who got them from the Indians, were not exactly the the same as those used by the Arabs. A glance at the various Cipher systems figured on the Plate II. will show what variety of form has existed and still does exist amongst the nine digits. Either, then, the system grew up simultaneously in different districts which used their own peculiar modifications of the unit figures; or, the principle alone spread. Sir E. Clive Bayley has given good reason for the belief that the *cipher* is a modified *ten*; and as the *circle* and the *dot* are the only symbols in use as a

6. Journal Asiatique, Series 6, Tom I.

cipher, however much the other figures may vary, it seems probable that the Cipher system was really developed in one district.

It is the cipher or *zero* which gives the system its peculiar power. Both words are from the same Arabic origin (sifr), which is simply the translation of the Sanskrit word "sunya," which means emptiness. This in fact was one of the names applied to the empty column or rod on the Abacus, and meant merely a condition or state. The Chinese similarly use the word *Ling* (零), pronounced *Rei* of the Japanese.[7] When a Japanese is reading out of a series of numbers to the *Soroban* worker, he inserts the *rei* where no significant figures occur. Thus instead of saying simply *san sen go* (3005), as he would in ordinary conversation, he reads *san sen rei rei go.* Formerly the pure Japanese word *tonde* (skipping) was used for the same purpose. The symbol (○) representing *rei* in mathematical works has been already referred to. In these days it is used in bank-notes and bank-books, exactly as our cipher is, for spacing out the numbers, the symbols *jū, hyaku, sen, man* being omitted. It never has been used, however, as a *cipher of calculation;* and it bears the evidence, as already pointed out, of being originally an importation from the west into China.

Taking the Chinese numerals as the type of the Decimal Stage, and our own numerals to represent the Abacus columns, we might imagine the development to the cipher stage as taking place in this wise. Up to *nine,* both Abacus and numerals are in accord. At *ten,* however, the next rod of the Abacus is brought into requisition, so that *ten* is represented by a combination of a

7. The primary meaning of (零) is 'the last drops of a shower,' or 'slow rain,' hence generally 'remainder,' 'residuum,' 'fraction,' etc. The meaning of 'zero' is generally supposed to come from these, as being of the nature of a degenerate number, something so small as to be valueless. Such an asymptotic derivation, as it might be called, seems almost too mathematical to be satisfactory. I should suggest an Abacus derivation as being at least as plausible. That is, just as our *cipher* and *zero* can be traced back to the Arabic *sifr* which was applied to the "empty" abacus rod or column; so many the Chinese 零 have been applied to the abacus rod from which the last counter had been made to "drop." The arguments in favour of this derivation are these: the term in its zero significance is originally arithmetical; arithmetic was formerly inseparable from the abacus; and we have in our own *cipher* an analogous derivation.

one and a *void*, which has no similarity to the single symbol 十. Up to nineteen, however, there is similarity, the 十 of 十九 being comparable to the 1 and the 九 corresponding to the 9 on the two contiguous abacus rods. The decade numbers 二十, 三十, 四十, etc., correspond very well with the Abacus indications 20, 30, 40, etc., where now of course the 十 is comparable to the empty space. The similarity somewhat breaks down at 二十一 (21); but the approximate similarity would suggest dropping the 十 here and writing 二一.[8] But this simplification, could lead to no confusion, the 十 only appears in the twenty, thirty, etc., since there it is required to denominate the two, three, etc. But consistency would suggest to write 一十 for *ten* or *one-ten*, exactly as 二十 stands for *two-ten*; and the "teens" would then stand a good chance of being treated like the twentys and thirtys. This mode of writing and saying *ten* is indeed met with in Japanese literature. Thus everything would come into accord with the Abacus representation, and the symbol 十 appearing only as a denomination would cease to be called *ten* and be named anew by the Abacus name for empty space. The extension of the system to higher numbers and the vanishing forever of symbols for the successive powers of *ten* would be an obvious improvement. In some such manner then—and Sir E. Clive Bayley has given historical evidence in support of the theory—did the Decimal pass into the Cipher Stage of numbering. The natural tendency of the human mind to simplification, aided at the right moment by the indications of the Abacus, produced from a chaos of symbols a numerical system which has determined more than any other one thing the rise and progress of mathematical science. In the history of Arithmetic the only event which is at all worthy to be compared with the introduction of the cipher is the discovery of Logarithms.

The spread of the Cipher system into Europe is itself an event of deep historical importance. Of all

8. This in fact is done by the Japanese in marking their counters in the game of *go* (碁), the 十 being dropped to save room; so that 34, 68 are written 三 ⁄ 四 八. The same system of contraction is not continued to the hundreds, however, a modified symbol (百) for *Hyaku* being introduced. Postage stamps and coins are similarly marked.

other systems of numbering, the Greek alone possessed any flexibility as a medium for calculation: but its operations were no doubt largely aided by the Abacus. The Sexagonal modification, perpetuated if not introduced by Ptotemy and the Alexandrian School, was a significant improvement and especially available for astronomical calculations. Since in this Sexagesimal system ξ (60) was the last symbol needed, the next symbol, o, has been supposed to have been the origin of our cipher. The Neo-Pythagoreans certainly used such a symbol and used it in a partial cipher signification: but there is no evidence that they knew of the decimal cipher previous to the 7th or 8th century. Whereas there is evidence in the writings of Aryabhata (360 A. D.) that the Indians knew the principle of "place-value" and used the zero at that time.[9]

The question we have now before us is: What causes prevented the development of a Cipher system in China or Japan? A partial explanation may be found in the mode of writing. The Chinese write in vertical columns from above downwards; and if they ever are compelled to write in a horizontal line they work from right to left. Now the Abacus is worked from left to right, a fact which tends to prove incidentally that the Abacus is not indigenous to China. The similarity between the numerals as written and the Abacus indications of the same would not be so striking to the Chinaman as to the Aryan or Semite, since these wrote in horizontal lines. Now so far as evidence goes, our numeral systems all passed to the races of Aryan origin through the Semitic peoples, who generally wrote from right to left. As will be seen in the subsequent part of the present paper, the Semite named his numbers by beginning with the unit or smallest denomination. Thus in Arabic it is five and twenty and one hundred, instead of one hundred and twenty-five. But in writing down a number he would write it as he named; and as he both, so to speak, wrote and named backwards, the result would appear as it is on the Abacus, 125. Now the early Indian spoke like the Arab, but wrote from left to right; while the Chinese always spoke as we do now

9. See Sir E. Clive Bayley's Second Paper for a full discussion of this point.

but tended to write from right to left. Hence if the Abacus had been an Indian or Chinese invention, the columns would probably have gone the reverse way, with the units to the left, so that one hundred and twenty-five would have appeared as 521. This argument of course cannot be urged in the face of evidence to the contrary; for we know that in ancient days both modes of writing were in use by the same people. In some inscriptions indeed the writer has turned backward along the next line, ploughman-like. Still as the Chinese write in vertical columns, so the Semitic peoples generally write from right to left and the Aryan from left to right. Hence, unless there were definite evidence to the contrary we should be inclined to regard the Abacus as not being primarily an Aryan invention, but more probably introduced to the Aryan races through the Semitic peoples. And this in itself is not improbable, inasmuch as the Semites were the great commercial peoples of the ancient world. There is one consideration which prevents us regarding it as a Semitic Invention, namely, the lack of the inventive faculty in the Semitic mind. And yet such a natural development of the early finger exercises as the Abacus is, might well lead to its invention even by a much less civilised community. In any case, we must regard the rise of commerce as an important influence in the evolution of all forms of calculating boards.

The diversity in the mode of writing and mode of placing on the Abacus a given number is hardly a satisfactory explanation of the persistency of the instrument amongst the Chinese; for the Tamils, who write from left to right and who have lived in close contact with cipher-using peoples, use to this day a system of numerals exactly similar to the Chinese. It remains to enquire as to the existence of some mental or linguistic peculiarity possessed by the Tamils and Chinese and not possessed by Aryan races. In other words—for we all believe in the doctrine of the survival of the fittest—are there any linguistic or mental peculiarities which may make the Abacus more efficient, that is, more rapid and more certain, than ciphering?

There is not the least doubt that as used by the Japanese the Abacus is for ordinary arithmetical operations more efficient than figuring. This efficiency I think

is traceable to their peculiarly suitable mode of numeration or number-naming. At first sight, many would be inclined to think there was no essential difference between the Japanese or Chinese numeration system and our own. But a closer study reveals to us a very striking difference indeed, which it is now our object to discuss.

The question of the nomenclature or naming of numbers opens up another and quite distinct line of enquiry; and Comparative Numeration, as it might be called, may lead to a clearer understanding of the historic bearing of the Abacus. Here we come face to face with one of the deepest problems of philology, the origin of the names of numbers. So far as regards the Aryan family of languages, some small advance seems to have been made towards the solution of this problem. Thus "three" has been connected with the root meaning to *pass over;* "seven" with the root meaning to *follow;* "nine" with the Sanskrit pronominal base meaning *new.* That is, to quote Sayce, three is named from its excess, seven from its following the foregoing numbers, while nine is the new number. The naming of three from its excess has received an ingenious explanation by Dr. Koelle,[10] who connects it with the length of the middle finger.[11] Reckoning with the aid of the fingers is of course the most natural of all methods and is the source of our wide-spread decimal system. In some savage tribes of the present day the very names used for *five* and *ten* signify "one hand" and "two hands;" and this metaphorical way of speaking is carried on by means of the toes, so that *twenty* is called "one man." Using the toes as well as the fingers

10. On the origin of the Turkish Numerals, Journal R. A. S., xvi (1884).

11. The general theory that the names of the numerals in all languages are connected with the peculiarities of the hand is as highly probable as it is difficult of proof. The simple figure-theory, as it might be termed, although it may hold for some few tongues, in general breaks down very early in the series of numbers. Before any such theory can be profitably discussed, it is necessary to know the natural order in which a given race uses the fingers in counting. That considerable diversity exists amongst peoples in this respect may be shown by the following examples. A European, in "telling" off his fingers numerically, would probably begin with the thumb of his left hand, marking each finger in succession by contact with the fore-finger of his right hand. He might then pass

seems to have been quite a favourite mode of numeration, as is evidenced by the existence of numerations which ascend by *twenty*;—the old decades (thirty, fifty, etc.) being words compounded of ten and the preceding decade. This method is found amongst tribes of the Caucasus and Hindu Khush, and in such widely scattered communities as the Basque, the Ainu, and the Mexican. The French names *soixante-dix*, *quatre-vingt*, *quatre-vingt-dix*, which have nearly displaced the regularly formed *septante*, *octante*, *nonante* still used in Switzerland and in the South of France, are perhaps a revival in spirit of the same method lingering through centuries. The tendency shown in some languages to group numbers in fours and sixes is not so easily explained, though the four-fold method may probably be referred to the fingers, as distinguished from the thumb. The grouping in sixes and twelves again, I believe to spring partly from the sacredness of the number

to his right hand to complete the ten, or simply repeat the operation on the left hand. An English school girl, who usually counts by a kind of five-fingered exercise on the table or desk beside her, first raises the hand slightly above the surface and then, begining with the little finger, brings down each finger-tip in succession until 5 is counted, after which a fresh start is made with the little finger. Thus the middle finger always means 3 or 8, the fore-finger 4 and 9, and so on. The North American Indians always begin with the little finger of the left hand and finish with the little finger of the right hand. According to Dr. Koelle, the Turks and the inhabitants of Western Africa begin, like the North American Indians, with the little finger of the left hand, but, unlike them, end with the thumb of the right hand. The Japanese, again, use only one hand after a fashion which seems to be peculiar to them. Beginning with the left hand open, they turn the thumb in towards the palm to represent *one*, bring down the fore-finger over it for *two*, and so on in succession till *five* is reached with the closed fist. For *six*, the little finger is raised again, and one by one the preceding operation is undone till ten is reached with the open hand. Thus the little finger alone means either 4 or 6; up along with its fellow, 3 or 7; all the four fingers up, 1 or 9. The Japanese have also several peculiar methods of silent bargaining, in which the buyer and seller grip each other's hands. In one of the most common of these, the price is indicated by the number of fingers grasped, the little finger meaning one, the thumb alone meaning five. Thus *three* is indicated by the little, ring, and middle fingers; *eight* by the thumb, fore, middle and ring fingers. Ten may be shown by grasping the second joint only of the thumb. The nature of the bargain sufficiently determines the money unit employed, or the possible range of the bargaining. If it is necessary to indicate two denominations of money, the higher is separated from the lower by a grasping of the wrist.

three, which has its origin far back in the days of the dawn of reason. Everything tends to show that, as man developed socially, *duality*, as a quality to be expressed by language, preceeded *plurality;* and the co-existence of dual and plural inflexions marks a stage in the growth of the human mind which the higher races of the present day have far outstripped. It is in peoples of low intellectual power that we find a fulness of explicitly expressed meaning that is unnecessary in the race of higher mental grip. The probability is then that the naming of the number *two* long preceded the naming of *three*, which, as in low savage races of historic times. would originally be synonymous with many. Hence the passing to three as a distinct conception would be a great stride in the mental progress of man, and might well perpetuate itself in a kind of superstitious reverence, especially in the presence of the three great natural divisions of sea, earth, and sky. Then again to early man, when writing was unknown, the use of a number which could be halved and "thirded" and quartered would be very natural—only too natural indeed as we know to our mental confusion now. It was this apparent simplicity, real then of course, which resulted in the evolution of our complex European tables of weights and measures, And the existence of such complications is, I think, a proof by the way, that the Abacus, with its strongly marked decimal character, never attained in Europe anything like the flexibility in calculation which it has attained in the East. In any case, however, the popularity of twelve as a basis for reckoning may be reasonably traced to its possessing many simple submultiples, and three amongst others. Duodecimal scales of numeration have been found amongst savage people notwithstanding their ten figures; and we may safely assert, that had man possessed six fingers, the decimal scale would never have been mentioned outside mathematical treatises.

After all, however, "ten" has been the favourite numeration it; so much so indeed that such numbers as eight and nine have been sometimes named in terms of it by a backward process very similar to the manner in which the Romans write IX for 9, XL for 40, and so on. Thus, amongst the Dravidian peoples, *nine* is usually expressed as *one-ten*; and in Finnish and some

related languages *eight* is expressed as *two-ten*. The same method is quite usual in the higher decades even among Aryan peoples, as for example in the Latin *duo-de-viginti*, *un-de-viginti*.

Passing now to the second decade of numbers, we notice that these have almost universally been named by combining or modifying the names of the first ten. Thus the derivation of the English *eleven* and French *onze* is simply *one-ten*, and of the English *twenty* and French *vingt*, *two-tens*. Twelve and twenty indeed have the same derivation, just as the very obvious Japanese *jū ni* and *ni jū*. In some languages 'twenty' is a distinct word having no apparent philological relationship to ten; and in Turkish, invention of terms is carried up to *fifty*, *sixty* being the first decade number which bears *six* on its face. This I regard as showing that the Turks possessed comparatively feeble powers of generalization, as being in fact a race mentally inferior in this respect to the Semitic peoples. In cases, however, in which the name of the successive decades were formed from the lower numbers, it was not always as in the Aryan and Chinese languages. The Hebrew 'twenty' was the plural, originally the dual, for 'ten'; and the succeeding decade names up to a hundred were the plurals of the corresponding digits, threes, fours, fives, etc.

Generally, and especially in the inflexional languages, the principle which philologists call Phonetic Decay has been very busy with the names of the higher numerals. This is shown especially in our own *eleven* and *twelve*, and to a striking extent in the modern Aryan languages of India. Now in this particular Chinese stands out as peculiarly exceptional. Etymologically, the name of every composite number from ten onwards is as clear cut as the day it was first formed. In the old Japanese numerals, as used before Chinese civilization was borrowed, there is evidence of Phonetic Decay to nearly the same extent as in English, as is apparent from the following table:—

1. Hito-tsu	6. Mu-tsu
2. Futa-tsu	7. Nana-tsu
3. Mi-tsu	8. Ya-tsu
4. Yo-tsu	9. Kokono-tsu
5. Itsu-tsu	10. Tō

20.	Hata-chi	60.	Mu-so-ji
30.	Mi-so-ji	70.	Nana-so-ji
40.	Yo-so-ji	80.	Ya-so-ji
50.	I-so-ji	90.	Kokono-so-ji

Hata is no doubt etymologically the same as *Futa*, or *Hu-ta*, as perhaps it should be more scientifically spelt; and the *so* in the higher decades is a modified terminal *tô*, just as in English *ten* has higher become *ty*, in German *zehn* has become *zig*. But it must be remembered that in many languages the names for the "teens," although containing the digit name, do not contain the name for ten. Thus in Hindustani the termination *ārah*, which corresponds to our *teen*, has no resemblance to *das* (ten); in Yoruba, one of the West African tongues, 11, 12, 13, etc., are called "great one, great two, great three": and a somewhat similar mode of derivation holds in the native languages of New Mexico.

There seems to be, then, in the native Japanese names for the numerals from twenty upwards, distinct evidence of phonetic decay, though not nearly to such a marked extent as in the geographically contiguous languages of Korea and Manchuria. Nearly all languages show in some form or other this influence, The only exceptions I have been able to find are Chinese, Roumanian and certain Polynesian languages. Roumanian is in many respects quite an exceptional language, while the Polynesian had probably no very extensive system of numeration[12] till they came in contact with Western thought. Chinese, however, is unique amongst old languages for the etymologically clear cut names of its derived numerals; and the same characteristic is of course displayed in the Japanese modifications of these.[13]

The mode of manufacture of our numerals is, broadly speaking, the same as that so clearly indicated in the Japanese names; but there is one difference which must strike the attention at the very outset. The Chinese and Japanese in naming the "teens" put the larger number,

12. The Hawaiians and New Zealanders seem to have reckoned by a system of "fours" originally.

13. Colloquially, phonetic changes almost of necessity creep in, as when the Japanese says *san jissen* instead of *san jū sen* for 30 cents (money).

the ten, first; whereas we put the digit number first. Thus *thir-teen* is Japanese *jū-san*. This is no mere accidental difference, for a closer study into the numerations of related languages seems to give to it a broad linguistic, perhaps ethnological, import.

Take for example our modern Aryan tongues. In all but a comparatively few cases,[14] which are capable of simple historical explanation, the universal usage is to name the numbers between ten and twenty in what we shall henceforth call the *inverse* way,—that is, the general succeed the special. In fact we name these numbers as we name ourselves, bringing the type or family name last. Thus our nomenclature and notation are at variance; we write 1-4 and say fourteen. If we wrote from right to left as the Arabs do, our notation and nomenclature would be in harmony. They are so with the Semitic peoples; and this is a strong argument, if argument were necessary now, for the non-Aryan origin of the numerals. With the single exception of the Gheez or old Ethiopic (which like the Assyrian was written from left to right) all Semitic languages agree with the Aryan in this inverse way of naming numbers. Even the Assyrian is no exception, for 'fifteen' was with them called *khamis-serit* (five-ten). The Assyrians of course borrowed a modified form of the Cuneiform writing of the Accadians, which sufficiently explains the mode of writing from left to right; and the Ethiopic was in many respects greatly modified by foreign influence. This mode of naming the smaller number first is found even to the higher decades. In Sanskrit, and its modern representatives, in the Scandinavian languages, in German even, and in Arabic, 23, 65, etc., are called "three (and) twenty," "five (and) sixty;" and in English this combination is often still employed in conversation. The influence of the notation has however compelled the more practical time-saving mind of the Briton to shake himself free of the old method in naming numbers above twenty; but hereditary habit is too strong to allow him to alter his "teens." The Romance languages largely follow their common source, which as we all know had latterly at all events "twenty-three, sixty-five," etc. The Greeks and Latins indeed,

14. The French, Italian, and Spanish names for the higher *teens*, and the modern Greek and Roumanian all through.

seem, like ourselves, to have adjusted their nomenclature in the higher decades to suit the direct way of reading the inverse notation borrowed from the East. The Sanskrit, however, resisted this harmonising all through even up to the highest named numbers. Thus 325 is named, "Five and twenty and three hundred," exactly as in Arabic and in Early Hebrew. Hence Hindustani, one of the modern representatives of Sanskrit, which uses a modification of the Arabic in writing, is thoroughly consistent in notation and nomenclature; but all the other Gaurian languages of India are saying one thing and writing another. If we may judge from the early Sanskrit writings on mathematics, the Abacus indications seem to have been read backwards, a most un-Aryan like procedure, and strongly suggestive of the remark made above, that the Abacus was borrowed by them from some neighbouring peoples. In the Keltic group of languages the same method of number-naming is adopted all through the decades; and in Welsh, Gaelic and Irish, the process is complicated by inserting the noun in the middle of the number. Thus eighteen men, twenty-six sheep, are expressed "eight men ten," "six sheep (and) twenty." In fact the older the dialect, or the less influenced it has been by contact with non-Aryan peoples, the more clearly marked is the inverse mode of naming numbers among the Aryans and the method has survived in the expression of the "teens" in almost all languages down to the present day.

Now Chinese and Japanese[15] are as direct as they can be in their number-naming, passing invariably from the general to the special, from the larger to the smaller. This fact, which I believe affords the explanation we are in search of, at once suggested to me the advisability of searching other languages for their systems of numeration. Numerals are such an important element in all philological research, that this might seem at first sight a very simple operation. But here in Japan, where there is no library for general reference, I have found it no easy matter; and very frequently the list of numerals obtained just skipped from ten to twenty, as if the intermediate

15. This statement applies to the *original* Japanese numerals as well to those of Chinese origin.

ones were of no account. Thus, in the long list of Turanian numerals given at the end of Bunsen's Philosophy of Universal History, comparatively few have the names for 11 and 12; hence for much of the information obtained I have to thank my linguistic friends in Tōkyō, and especially the Vice President and the Corresponding Secretary of the Society for the trouble they have taken in ferreting out the facts required.

The general facts of the investigation are these: The Aryan and Semitic peoples, almost without exception, name the smaller number first,—thirteen, fourteen, and so on. The Ural-Altaic, the Dravidian, the Tibeto-Burman and the Chinese peoples, with as rare exceptions, name the large number first,—ten-three, ten-four, etc. The following two lists give all the languages that have been investigated, with the exceptions added.

I. Inverse Method:—Smaller component first—Aryan Language; Assyro-Babylonian, Sabean, Hebrew, Syriac, Arabic, and probably Semitic generally; Shina (Hindu Khush tribe); Ainu; Malay, Malagasi; Yoruba; Apache, Navajo; Maya (Ancient Mexican).

Exceptions:—Modern Greek, Roumanian, Ethiopic.

II. Direct Method: Large component first.—Chinese; Korean; Japanese, Manchu, Samoied, Turko-Tatar, and Siberian generally, Magyar; Burmese, Tibetan, Lepcha, Singpho, Changlo, Mikir, Miri, Kunâwari, Dophla, Naga, Shendu; Siamese, Miautsi; Avâr; Dravidian languages, Tamil, etc.; Kolarian languages, Ho, Savara, etc.; Alarodian languages. Lezian, etc.; Nubian dialects; Vei; Hottentot; Hausa; Coptic; Basque; dialects of Hindu Khush tribes, Khowar, etc.; and many languages of the North American Indians.

Broadly then we may say that, excepting the great Ayran and Semitic families, the Malay group, and some of the languages of Central America, New Mexico and Western Africa, all mankind tend to numerate in what we have called the Direct method.

The question will naturally suggest itself, which is the superior method, the Inverse or the Direct? From the outlook of the present day, the direct method appears the more scientific and therefore the more reasonable; and there can be no doubt that in any case the Chinese systematically direct mode of naming is superior to the more

or less muddled modes of the Aryan Europeans. The process by which these came to be as they are is clear in the light of history. It sprang from the necessity of adjustment between old and new knowledge as the Aryan developed his civilisation by borrowing and making his own whatever was purpose-like in the customs of the nations around him. His original method of numeration seems to have been the Inverse method, in which he was at one with the Semite. From the latter he learned to write, to read, and to calculate, sometimes modifying the methods of his teacher to suit his own intuitions, sometimes modifying his own methods to suit his teacher's. He in general persisted in writing from left to right; but he did not change the borrowed symbolising of numbers, whether by pen or by abacus, to suit at once his numeration and his mode of writing. On the contrary, the numeration gradually changed to suit his mode of writing and reading the symbolised numerals; and now amongst the European races the direct method of number-naming has largely displaced the inverse method. Thus we see that in the naming of numbers the Aryan races have been greatly influenced by the notation which they borrowed in the first place from their neighbours of older civilisation, This notation, perpetuated and perfected in the cipher system of the day, begins, from an Aryan point of view, with the highest denomination of number and ends with the lowest; while from a Semitic point of view it begins with the lowest and ends with the highest. Now as regards ease of calculation it is of no consequence in what order the components of any symbolised number are taken. We could, after the little practice necessary to free ourselves from the influence of a life-habit, multiply three hundred and fifty-seven by six as easily by writing it 753 as by writing it in the ordinary direct way 357. Furthermore, the operation would then proceed from left to right and so be in greater harmony with general Aryan method. We see then, that a perfectly consistent and systematic arithmetic is as possible with the Inverse as with the Direct mode; and that the present triumph of the latter over the former is simply an illustration of the principle of conservative momentum. Intrinsically it has no real superiority. If the Aryan had developed his own methods independently, he would almost certainly have continued to

speak inversely, and his notation would have fitted itself perfectly thereto,—the smallest number denomination being written first instead of last. But he obtained his notation as he obtained his alphabet—from Semitic sources; and as the necessities of commercial intercourse, aided largely no doubt by the indication of the Abacus, compelled him to hold to the written order of the numerical symbols, he gradually changed his naming to suit his way of reading the numbers. This view is supported by the fact that the change in number-naming took place earliest in those nations which were first influenced, namely, amongst the Greeks and Latins. The forms *δεκαδύω*, *δεκαπέντε*, etc., are indeed met with as early as B.C. 200; but the older forms are *δώδεκα*, *πεντεκαίδεκα*. And so we find that the modern languages which represent Greek and Latin have, generally speaking, carried out the change more completely than the Keltic and Teutonic groups of languages. Thus it appears that the irregularity in the Aryan modes of naming is a result of the peculiar method of borrowing and assimilating by which the civilisation of the race developed; that primarily the Aryans like the Semites named their numbers by what we have called, for the sake of convenience, the Inverse method; and that gradually they have changed to the Direct method under the influence of the notation. Taken in their purity and completeness, neither method can claim superiority so far as symbolising and facility in calculation are concerned.

It remains then to compare them as mere methods of speech. In other words, has either method any practical advantage over the other, regarded simply in its colloquial relations? From this point of view, I am inclined to think that the Inverse method is practically the superior, as being in fact the more emphatic. Putting the smaller denomination of number first at once arrests the attention of the listener, who from general acquaintance with the subject matter might infer the higher denomination. It is in fact the smaller number which the listener, generally speaking, wishes to know; and the sooner he knows that the better. The Gaelic method of saying "five men and twenty" is a very good illustration of the principle. It may be, then, that the Inverse mode of

naming compound numbers betokens a stronger individuality, a more pronounced determination on the speaker's part to be understood, but that it has in large measure been replaced by the direct mode under the powerful influence of a borrowed notation.

Summary and Conclusion.

The Abacus, as used in China and Japan, bears, on the very face of it, evidence of a foreign origin. The numbers are set down on it with the larger denomination to the left, a result which could come from a people either speaking and writing inversely, or speaking and writing directly. Historically, the home of the Abacus is in India; but it could hardly have been invented by the Aryan Indians, who wrote directly and spoke inversely. The probability is they borrowed it from Semitic peoples, who were the traders of the ancient world; and these may have invented it, or, as it perhaps more probable, received it from a direct-speaking, direct race, such as we know the highly cultured Accadians to have been.

In early times the Abacus, as being an evolution from the natural Abacus—the human hand—pursued a course of development entirely different from that of the graphic representation of numbers. This latter we can trace through four stages,—the Pictorial, the Symbolic, the Decimal and the Cipher. The Pictorial we find in the Egyptian hieroglyphlics, the Accadian Cuneiform, and the technical Chinese of mathematical treatises; the Symbolic in the numerous methods which grew up with the development of alphabets and syllabaries; and the Decimal in the simplifications of these, which live to-day in the Chinese and Tamilic systems. Once the Decimal stage was reached, its general similarity to the Abacus indications suggested bringing them into still closer correspondence.

This advance seems to have taken place amongst the Aryan Indians, who along with the Aryans of the West very soon discarded the Abacus for the more convenient Cipher notation. With the Chinese, Tamils and Malayalams of South India, no advance was made in this direction; the reason being simply that the Abacus better suited their numeration. These peoples speak directly, so that their nomenclature fits in perfectly with the Abacus

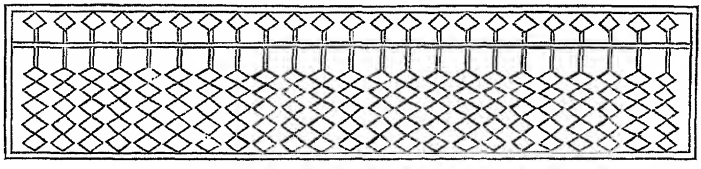
indications, and makes its manipulation more rapid and certain than calculation by ciphering. An Aryan Indian with his inverse speaking could never work the Abacus with the same facility as a Japanese unless he worked from right to left—a mode of procedure quite foreign to his nature. It is not so foreign to Chinese and Japanese, however, to work from left to right, as each individual character is formed in this way. It may be safely concluded that only amongst a people who used the direct mode of naming numbers, or who with the inverse mode of naming preferred the inverse mode of manipulating, could the Abacus in the form in which it was evolved ever attain the beauty of action of the Japanese *Soroban.* To the discussion of its peculiar merits we now proceed. We shall employ throughout the Japanese name, which it should be noted is simply a mispronunciation of the Chinese name—*Swanyan.*

PART II.—THE SCIENTIFIC ASPECT.

The Soroban may be defined as an arrangement of movable beads, which slip along fixed rods and indicate by their configuration some definite numerical quantity. Its most familiar form is as follows. A shallow rectangular box or framework is divided longitudinally by a narrow ridge into two compartments, of which one is roughly some three or four times larger than the other. Cylindrical rods placed at equal intervals apart pass through the ridge near its upper edge, and are fixed firmly into the bounding sides of the framework. On these rods the counters are 'beaded.' The size of the counters determines the interval between the rods, the number of which will of course vary with the length of the framework. Each counter (Japanese *tama,* or ball) is radially symmetrical with respect to its rod, on which it slides easily. Looked at from in front of the box, the form in perspective is that of a rhombus, the rod passing through the blunt angles. This double cone form makes manipulation rapid, the finger easily catching the ridge-like girth of the *tama.* On each rod there are six (sometimes seven) *tama.* Five of these slide on the longer

segment of the rod, the remaining one (or two) on the shorter. When the *tama* on any segment of a rod are set in close contact, a part of the rod is left bare. The length of this bare portion is determined by a double consideration. It must be long enough to be clearly visible, and yet not so long as to make action of the fingers irksome by reason of excessive stretching.

When a Soroban is lifted indiscriminately, the counters will take some irregular configuration upon their rods, being limited in their motions by the bounding walls and the dividing ridge. To prepare it for use, the framework is tilted slightly with the smaller compartment uppermost, so that each set of five counters slips down to the bounding wall end of its rod and each single counter[16] on its short rod slips down upon the upper surface of the dividing ridge. The framework is then gently adjusted till all the rods become horizontal, so that if any counter is shifted it will have no tendency to move back to its former position. By a sweep of the finger tips along the surfaces of the single counters, these are driven from their contact with the dividing ridge to the other extremities of the rods. In this configuration in which the counters are all as far away as possible from the dividing ridge, the Soraban is prepared for action. The number represented is zero. This position is shown in Fig. 1.

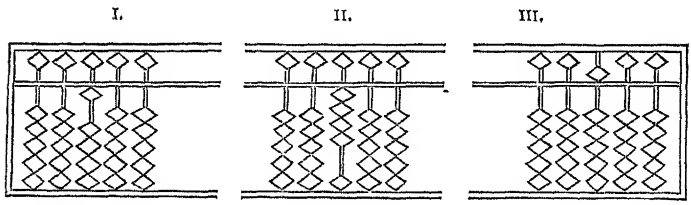


(Fig. 1.)

Let now any first counter of a set of five be moved till it is stopped by the ridge, as shown in the first diagram of Fig. 2. This will represent 1, 10, 100, 1000, etc., as may be desired. Let it represent 1, then a second moved up will give us 2, a third 3, a fourth 4. This last is

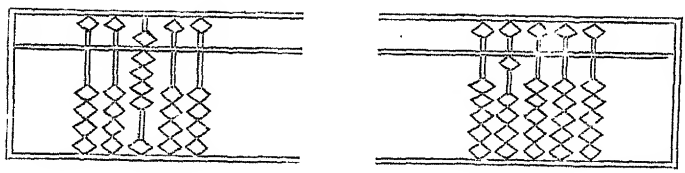
16. We shall henceforth only speak of *one* counter as being on the short rod. The two counters, although facilitating somewhat certain operations in division, are not really necessary, and their use is exceptional.

shown in the second diagram of Fig. 2. The last moved up will of course give 5; but this number is also given by pushing back the five counters to their zero position and bringing down the corresponding single counter to the ridge. This is shown in the last diagram of Fig. 2.



(Fig. 2.)

Leaving this single one in position, we get 6 by pushing up 1, 7 by pushing up 2, and so on till 9 is reached as shown in Fig. 3. The number 10 is then represented either by moving up the last counter, or more usually by clearing the rod of all its counters and moving one up on the next rod to the left, as shown also in Fig. 3.

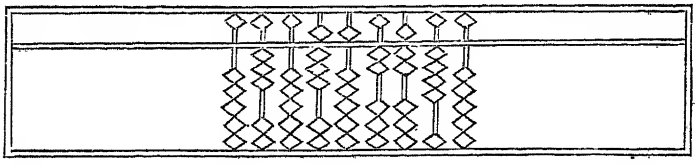


(Fig. 3.)

The mode of representing any number is thus obvious, being simply a mechanical model of our cipher system. Each rod corresponds to a definite figure 'place' (Japanese *Kurai* 位) or power of ten. One being first chosen as the unit, the next to the left is the 'tens,' the next the 'hundreds,' the next the 'thousands' and so on; while the successive rods to the right will represent the successive decimal places—tenths, hundredths, etc. When the counters are as far as possible from the dividing ridge they have no value; when they are pushed as *near* the ridge as possible they have values as already indicated. The single counter when pushed down upon the ridge has five times

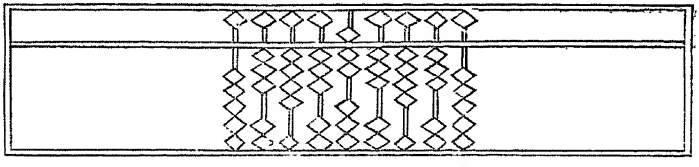
the value of any other counter upon that rod. In Fig. 4, the number 3085·274 is shown. The mark V is placed over the 'units' rod.

V



(Fig. 4.)

The operations of addition and subtraction are self-evident. Thus let it be required to add to this number 352·069. On the 'hundreds' rod push up 3; and proceed throughout whenever it can be done in this way. On the 'tens' rod, however, where only two counters are left, it is impossible to push up 5. But since $50 = 100 - 50$, the addition is affected by pushing up one counter on the 'hundreds' and removing 5 from the 'tens' rod. This gives of course 4 on the 'hundreds' rod and leaves 3 on the 'tens.' Then push up 2 on the 'units' rod; then 1 on the 'tenths' rod with a simultaneous removal of 4 from the 'hundredths' rod, since $10 - 6 = 4$; then 1 on the 'hundredths' rod with a simultaneous removal of 1 from the 'thousandths' rod. The final result 3437·843 is given in Fig. 5.



(Fig. 5.)

Subtraction is executed in a similar manner. It will be noticed that these operations involve no mental labour beyond that of remembering the complementary number, that is, the number which with the given number makes up 10. A glance at the configuration on any rod is sufficient to show if the addition (or subtraction) of a named number can be effected on it; and if this cannot be, it is necessary simply to add (or subtract) one to (or

from) the next higher place and subtract (or add) the complementary number from (or to) the place in question. In first experimenting with the Soroban, an operator who is accustomed only to our Western modes of figuring is apt to add mentally, and then set down the result on the instrument. Such a mode is inferior of course to the ordinary figuring method, being liable to error, inasmuch as the number that is being added is not visible to the eye at any time, and the number that it is being added to disappears in the operation. But if any one will take the trouble to dispossess himself of his Western methods and work in the manner indicated, he will find Soroban addition and subtraction both more rapid and more certain, because attended by less mental exertion, than in figuring. The one seeming disadvantage in the Soroban is that the final result of each step alone appears, so that if any error is made, the whole operation must be carried through from the beginning again. Almost all writers on China or Japan, who have noticed the instrument, bring this forward as a serious disadvantage. But such a conclusion is a hasty one, and shows the writer to possess but small acquaintance with Soroban methods, and little regard to the true aim of calculation. For after all it is the result we wish; and if an error has been made, repetition is necessary both with Soroban and ciphering. The mean position of an accidental error is of course half-way through; and this would tell in faovur of the ciphering system. But on the other hand, the Soroban is, on the average, much more rapid than ciphering, and less liable to error. Only a lengthened series of comparative experiments could establish whether there is any real disadvantage at all.

MULTIPLICATION.

Multiplication on the Soroban differs but slightly from our own methods, being effected by means of a Multiplication Table—*ku ku gō sū* (九九合數),[12] literally, nine-nine combining number. Two peculiarities distinguish this table from ours. First, there is a complete lack of interpolated words like our "times," the multiplier, mul-

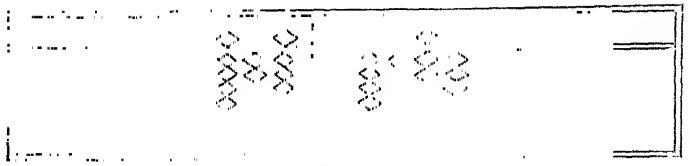
12. Generally called simply *ku ku*.

tiplicand, and product being mentioned in unbroken succession; and second, the multiplier, that is the first named number, is always the smaller. Thus the multiplication table for six runs:

ichi	roku	roku
ni	roku	jū ni
san	roku	jū hachi
shi	roku	ni jū shi
go	roku	san jū
roku	roku	san jū roku
roku	shichi	shi jū roku
roku	hachi	shi jū hachi
roku	ku	go jū shi

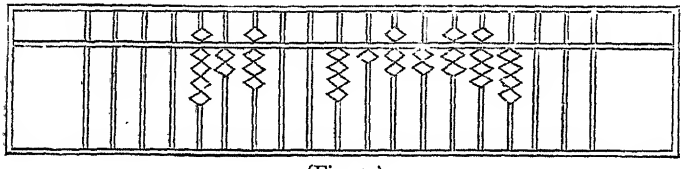
It is unnecessary to go to 12 as we do. Knowledge of a multiplication table for any number higher than 9 would retard Soroban manipulation. We British at least are compelled to learn up to 12 because of our monetary system; and it is often serviceable to know the table for 16. One is early struck by the inability of most Japanese students to multiply by 12 or even 11 in one line.

In multiplying two numbers together on the Soroban, the operator sets the two numbers somewhat apart on the instrument, the multiplier being to the left, the multiplicand to the right. There must be left to the right of the multiplicand a sufficient number of empty rods, a number at least equal to the number of places in the multiplier. The operation is essentially the same as ours; only instead of multiplying the multiplicand by each figure of the multiplier as we do, the Japanese multiplies the multiplier by each figure of the multiplicand. As the operation goes on the multiplicand gradually disappears, so that finally only the multiplier and product are left on the board. An example will render the method clear. Let it be required to multiply 4143 by 928. Set these on the Soroban, the multiplier anywhere to the left, and 3 empty rods at least to the right of the multiplicand. Henceforward in the diagrams we shall represent visually only the counters which happen to be in use.



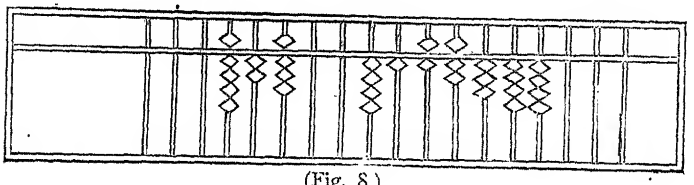
(Fig. 6.)

Multiply 8 by 3 and set 24 on the Soroban so that the 4 lies just as many places to the right of the multiplicand 3 as there are figures in the multiplier. This 4 is of course in the 'units' place of the product; and we shall continue to name the other places accordingly. Next multiply the 2 by 3, and add the product 6 to the 'tens' rod. This gives as the result so far 84. Lastly multiply 9 by 3. This requires 7 to be added to the 'hundreds' rod, and 2 to the 'thousands' rod. But before this latter operation can be done, the 'thousands' rod must be cleared of its multiplicand 3, which having completely served its purpose may easily be removed, and indeed is better away. Since 3 is to removed and 2 added, it is sufficient to remove 1 and leave 2. The result so far is shown in Fig. 7.



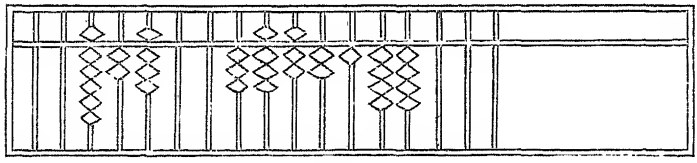
(Fig. 7.)

Now proceed to multiply with the next figure of the multiplicand, 7 namely:—$7 \times 8 = 56$, of which the 5 is to be added to the 'hundreds,' and 6 to the 'tens' rod; $7 \times 2 = 14$, that is, 1 to the 'thousands,' 4 to the 'hundreds;' $7 \times 0 = 63$, that is, leave 6 on the 'ten thousands' rod by taking off 1 from the 7 and add 3 to the thousands. The result of this operation is given in Fig. 8.



(Fig. 8.)

The operations with 1 and 4 are similarly carried out, care being taken to add the numbers which make up each several product in their proper places, and to suppress the multiplicand figure at the final operation with the same. The final result is given in Fig. 9.



(Fig. 9.)

It will be noticed that in all addition or subtraction processes, the number is added to or taken from the rod rather than from the number on the rod. The eye can tell at a glance if this operation can be effected on the rod in the question, or if the next rod to the left has to be called into play. Mental labour is thus reduced to a minimum. The operator hears or utters a certain sound, which means one of two operations. A glance shows which of these it must be; and the fingers execute a certain mechanical movement which accompanies the sound of the words as naturally as the fingers of a pianist obey the graphic commands of a Sonata.

We see then how well fitted for Soroban use is the Chinese and Japanese momenclature of the numerals; and how ill adapted all such systems must be which say sixteen and five-and-twenty instead of teen-six and twenty-five.

Division.

Division on the Soroban, although essentially the same as our own Long Division, is in many respects peculiar and almost fascinating. The *art* of it is based upon a Division Table, called the *ku ki hō* (九歸法) or Nine Returning Method, which is learned off by heart. This we give in full as it is pronounced, with an accompanying translation as literal as possible.

Division Table for *Ichi* (one).

ichi is shin ga in jū	one one gives one ten
" ni " " ni "	one two " two tens
" san " " san "	" three " three "
and so on to	
ichi ku shin ga ku jū	one nine gives nine

Division Table for *Ni* (two).

ni ichi ten saku no go	two one replace by five
" ni shin ga in jū	" two gives one ten
" shi " " ni jū	" four " two tens
" roku " " san jū	" six " three "
" has " " shi jū	" eight " four "

This Table could well stop at "ni ni shin ga in jū," since the higher ones are simply combinations of the first two. This is recognised by the absence of the "two five" statement.

Division Table for *San* (three).

san ichi san jū no ichi	three one thirty-one
" ni roku " " ni	" two sixty-two
" san shin ga in jū	" three gives one ten

The rest is obvious, being indeed but a repetition of the first three statements.

Division Table for *Shi* (four).

shi ichi ni jū no ni	four one twenty-two
" ni ten saku no go	" two replace by five
" san shichi jū no ni	" three seventy-two
" shi shin ga in jū	" four gives one ten

Division Table for *Go* (five).

go ichi ka no ichi	five one add one
" ni " " ni	" two " two
" san " " san	" three " three
" shi " " shi	" four " four
" go shin ga ni jū	" five gives one ten

Division Table for *Roku* (six).

roku ichi ka ka no shi	six one below add four
" ni san jū no ni	" two thirty-two
" san ten saku no go	" three replace by five
" shi roku jū no ni	" four sixty-four
" go hachi jū no ni	" five eighty-two
" roku shin ga in jū	" six gives one ten

Division Table for *Shichi* (seven).

shichi ichi ka ka no san	seven one below add three
" ni " " " roku	" two " " six
" san shi jū no ni	" three forty-two
" shi go jū no go	" four fifty-five
" go shichi jū no ichi	" five seventy-one
" roku hachi jū no shi	" six eighty-four
" shichi shin ga in jū	" seven gives one ten

Division Table for *Hachi* (eight).

hachi ichi ka ka no ni	eight one below add two
" ni " " " shi	" two " " four
" san " " " roku	" three " " six
" shi ten saku no go	" four replace by five
" go roku jū no ni	" five sixty-two
" roku shichi jū no shi	" six seventy-four
" shichi hachi " roku	" seven eight-six
" hachi shin ga in jū	" eight gives one ten

Division Table for *Ku* (nine).

ku ichi ka ka no ichi	nine one below add one
" ni " " " ni	" two " " two
" san " " " san	" three " " three

and so on to

ku hachi ka ka no hachi	nine eight below add eight
" ku shin ga in jū	" nine gives one ten

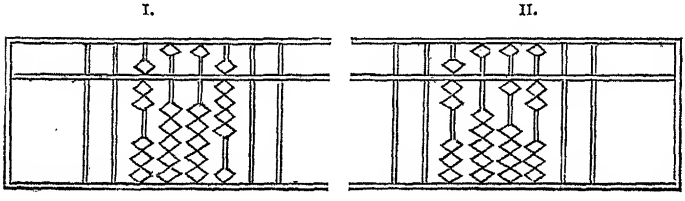
It will be noticed that the essential parts of the division tables take no account of the division of a number higher than the divisor. Hence in division, the larger number is named first; whereas in multiplication, as we saw above, the smaller number is named first. Thus the Japanese gets rid of such interpolated words as "times" and "into" or "out of," which are necessary parts of our multiplication and division methods.

In order clearly to understand this table, we must bear in mind that division is always at least a partial transformation from the denary scale to the scale of notation of which the divisor is the base. The adoption of the denary or decimal scale by all civilised nations is due entirely to the fact that man has ten fingers. There is no other peculiar charm about it; in some respects the duodenary scale would certainly be superior. As a simple example let us divide nine by seven; we

get of course once and two over. This means that the magnitude which is represented by 9 in the denary scale is represented by 12 in the septenary scale. In this case the transformation is complete. We may test the accuracy of our work by writing down the successive numbers in the two scales.

Denary	1	2	3	4	5	6	7	8	9
Septenary	1	2	3	4	5	6	10	11	12

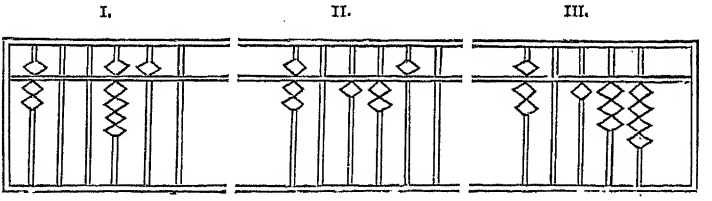
Now let us work out the problem on the Soroban. Set down the number 9 with 7 a little to the left. The division table for seven takes no account whatever of the number nine; but it says "shichi shichi shin ga in jū," or as it might be paraphrased, "seven seven gives one ten"—where "ten" signifies not the number but rod. As the operator repeats this formula, he removes 7 from the nine and pushes 1 up on the next rod to the left. The operation is shown in diagram 1 of Fig. 9.



(Fig. 9.)

Now this number, represented by 12 in the septenary scale, we cannot call twelve, because twelve means ten and two, whereas here we have only seven and two. Practically we keep the unit as in the denary scale and use the phrase two-sevens, which really signifies two in the septenary scale. A more complex example will make it clearer. Let it be required to divide 95 by 7; in other words, how many times is 7 contained in 95. By ordinary processes we obtain 13 and 4 over. This 4 is in the septenary scale; but 13 is still in the denary scale. Hence the transformation is only partial. To complete the transformation into the septenary scale we must express the denary 13 as the septenary 16; so that finally the denary 95 = septenary 164. In this septenary number the 6 means 6 sevens, and 1 means 1 seven-sevens; precisely as in the denary number 9 means from its position 9 tens.

Practically of course we keep the quotient in the denary scale and say 13 and 4-sevenths. Now perform this on the Soroban. First, as before, we remove 7 from the 9 and move 1 up on the next rod to the left. The Soroban now reads 125 as shown in diagram of Fig. 10.



(Fig. 10.)

We have now to divide twenty-five by 7. The Soroban manipulator, however, does not look so far ahead, but deals simply with the twenty, or what is the same thing, the 2 on the 'tens' rod. His division table says "Shichi ni ka ka no roku," or as we may paraphrase it, "Seven out of two, add six below," which implies that the 2 is to be left as it is and 6 added to the next rod, to the right. (This is precisely the equivalent of seven out of twenty, twice and six). Now it is evident at a glance that we cannot add 6 to the next rod, which has already 5 on it. But, bearing in mind that we are still dividing by seven, we remove seven from the overfilled rod and push one up on the 'tens' rod. Hence the operator is to add one to the 'tens' rod, remove seven from, and add six to, the 'units' ($1 = 7 - 6$). The general rule is obvious. If the remainder number to be added to any rod equals or exceeds the number of unused counters on that rod, then one counter is pushed up on the rod immediately to the left, and from the first named rod is subtracted that number which with the remainder makes up the divisor. Hence the final result stands as is shown in diagram 3 of Fig. 10, where 4 appears as the remainder.

As another example let us divide 427032 by 8. We may represent the operations symbolically thus, naming the successive results by *a*, *b*, *c*, *d*, *e*, *f*, and drawing a bar to show how far the operation has advanced. The translation of the Japanese verbal accompaniment to these operations is given below:

(8)	4	2	7	0	3	2
a.	5 |	2	7	0	3	2
b.	5	3 |	3	0	3	2
c.	5	3	3 |	6	3	2
d.	5	3	3	7 |	7	2
e.	5	3	3	7	8 |	8
f.	5	3	3	7	9 |	

a. Eight four, replace by 5.
b. Eight two, below add 4 (which being impossible means add 10^{14} take off 4).
c. Eight three, below add 6.
d. Eight six, seventy-four.
e. Eight seven eighty-six.
f. Eight eight, gives one ten.

The chief advantage of the Soroban over ciphering lies in the absence of all mental labour such as is necessarily involved in the "carrying" of the remainder to the next digit. Once the Division Table is mastered and the fingers play obediently to the sound, the whole operation becomes perfectly mechanical. The only disadvantage is the often mentioned one, that the dividend disappears in the process. But this, as we have seen, is a small thing after all.

We shall now go through a problem in long division; and here the process is very similar to our own. Indeed, it can hardly escape notice that short division on the Soroban is essentially the same process as long division with us.

Let it be required to divide 703,314 by 738. Here again we shall symbolically represent the successive operations, so far as is necessary for clearness.

(738)		7	0	3	3	1	4
a.	1 |	0	0	3	3	1	4
b.		9 |	7	3	3	1	4
c.		9 |	3	9	1	1	4
d.		9	5 |	4	1	1	4
e.		9	5 |	2	2	1	4
f.		9	5	2 |	8	1	4
g.		9	5	3 |	1	1	4
h.		9	5	3 |	0	0	0

14. This 10 is not "ten" but "eight", since for the moment we are working in the octenary scale.

The start is made by consideration of the first figure on the left of the divisor.

a. Seven seven, one ten. Take account of the next figure in the divisor, multiply it by the 1 already obtained in the quotient and subtract the product from the second place in the dividend. Clearly this is impossible. Now observe that the first two figures of the line opposite *a*, namely 10, are really in the septenary scale.

b. Hence take 1 from 10 (not ten but really seven) and add 7 to the next lower rod.

c. Use 9 as multiplier now; subtract 9 times 30 or 270 from 733 and then 9 times 8 or 72 from the remainder. This completes the first operation, and is essentially the same as first stage in the ordinary long division method.

d. Start afresh as before with "seven three, forty two." But 2 is greater than 1, the unused counter on the corresponding rod. Hence add one to 4 on the second rod and subtract 5 (7—2) from the third rod.

e. Use 5 as multiplier; subtract 5 times 30 from 411, and 5 times 8 from the remainder.

f. Start once again with "seven two, add six below."

g. "Seven seven, gives one ten;" which means,—add one to the third rod, subtract seven from the fourth.

h. Use 3 as multiplier; subtract 3 times 30 from 114, and 3 times 8 from the remainder.

Here again in the complete absence of any mental labour lies the peculiar merit of the Soroban. The only operation which calls for special remark is *a*, in which the first figure of the quotient is obtained by a process singularly rapid and free from all concentration of mind.

It is not necessary for rapid manipulation of the Soroban that one who is accustomed to western modes of thought should use the Japanese Division Table. We may substitute our own peculiar method of dividing. There are, however, two of the Japanese Tables which are singularly beautiful in their construction, the one for 5 and the one for 9. For example let us divide 240635 by 5. The Table says "five two, add two," which is exactly the equivalent ultimately of our statement that "five into

twenty give four." We may show the process symbolically thus:

(5)

2	4	0	6	3	5
4 |	4	0	6	3	5
4	8	0 |	6	3	5
4	8	1	2 |	3	5
4	8	1	2	6 |	5
4	8	1	2	7 |	

The process simply amounts to multiplying by 2 and dividing by 10; but with the Soroban it is peculiarly rapid.

Again let us divide the same number by 9. The Table says "nine two add two below," which is identical in result with "nines in twenty twice and two," and so with the others. Symbolically we have:

2	4	0	6	3	5
2 |	6	0	6	3	5
2	6 |	6	6	3	5
2	6	6 |			

Here we cannot add 6 below; but instead we take off 3 (9—6) and put on one above as usual. Hence we obtain:—

2	6	7 |	3	3	5
2	6	7	3 |	6	5
2	6	7	3	7 |	2

The 2 is the remainder of course.

Extraction of Square Root (*Kai hei hō* 開平方).

This requires, as in the ordinary ciphering process, a knowledge of the squares of the nine digits; but its peculiarity lies in the use of another table of half-squares, *Han ku ku* (半九九). In both the Soroban and ciphering processes, the basis is the algebraic truth that the square of a binomial is the sum of the squares of the two components together with twice their product, or the corresponding geometrical theorem that if a straight line be divided into two parts, the square on the whole line is equal to the sum of the squares on the two parts together with twice the rectangle contained by the parts. In the arithmetical extraction of square root, too, quantity is

considered as consisting of two parts, the first part being that multiple of the highest power of 100 contained in the number which is a complete square. Thus the number 6889 is divided into 6400 and 442. But

$$6400+489=80^2+489$$

so that 80 is the first approximation to the value required. If we compare this with the binominal expression

$$\begin{aligned}(a+b)^2&=a^2+2ab+b^2\\&=a^2+(2a+b)b\end{aligned}$$

we see that our next operation must be to form the divisor $2a+b$ that is, in the numerical case, $160+a$ quantity still unknown, but this quantity still unknown is also the quotient of the remainder 489 by the divisor. The process is to use 160 as a trial divisor, so as to get an idea what the unknown quantity may be. In this case we obtain 3, which added to 160 gives 163; and this multiplied by 3 gives 489. Hence the square root of 6889 is 83. Now in this mode of procedure a divisor quite distinct from the final result has to be formed. In the Soroban, however, whose peculiar feature in all operations is the disappearance of the various successive operations as the result is evolved, a distinct divisor does not appear. Thus, by an obvious transformation, we have

$$(a+b)^2=a^2+2(a+\tfrac{b}{2})\,b$$

Comparing this as before with

$$6889^2=80^2+489$$

we see, that by *halving* the remainder 489, we may employ a itself, that is 80, as our trial divisor. In completing this step we must take $\frac{1}{2}\,b^2$ instead of b^2; and hence the importance in the Soroban method of the table of half squares. The simplicity of the method will be recognised from the following example. It is required to extract the square root of 418,609. As in ordinary ciphering, tick off the number in pairs, beginning at the right hand. Then clearly 600 is the first approximation to the value of the square root, or 6 is the first figure in the answer. Move up 6 on a convenient rod somewhat to the left. The successive operations are given symbolically below, the description following as in the previous examples.

	6	4	1	8	6	0	9
a.			5	8	6	0	9
b.			2	9	3	0	4.5
c.	64			5	3	0	4.5
d.				4	5	0	4.5
e.					3	0	4.5
f.						2	4.5
g.	647						0

a. Subtract 6^2 or 36 from 41 leaving 5.
b. Halve the whole remainder 58609.
c. Use 6 as trial divisor of 29. This gives 4. Subtract 4×6 or 24 from 29, leaving 5, and consider 64 as the full divisor.
d. Subtract half the square of 4 from 53. This completes the second stage.
e. Start with 6 again as trial divisor of 45, or more accurately 600 as trial divisor of 4504·5. This gives 7. Subtract 7×6 or 42 from 45.
f. Subtract 7 times 40 from the remainder 304·5.
g. Subtract half the square of 7 from the remainder 24·5. 647 thus appears as the last divisor and, as there is no remainder, it is the square root of 418,609.

The whole process may be easily proved by considering the expansion of the square of a polynomial. Take for example the quadrinomial

$$(a+b+c+d)$$

$$\begin{aligned}(a+b+c+d)^2 &= a^2+b^2+\ c^2\ +d^2 \\ &\quad +2\,ab+2\,bc+2\,cd \\ &\quad +2\,ac+2\,bd \\ &\quad +2\,ad \\ &= a^2+2\left[\left(a+\tfrac{b}{2}\right)b\right. \\ &\quad +\left(a+b+\tfrac{c}{2}\right)c \\ &\quad \left.+\left(a+b+c+\tfrac{d}{2}\right)d\right]\end{aligned}$$

Extraction of Cube Root (*Kai ryu hō* 開立方).

The difference in the Soroban and ciphering processes arises from the same cause as in the case of square root. That is, instead of preparing a divisor, the Soroban worker prepares the dividend. The much greater complication in the base of the cube root necessitates an *undoing* of the processes of preparation at each successive stage—a mode of operation which was obviated in the case of square

root by the use of the table of half squares. The analogous table of "third cubes" would be excessively awkward in operating with, because of the decimal non-finiteness of the fractions of three. The operator is expected to know by heart the table of cubes, or *Sai jō ku ku* (再乘九九). As in the ordinary ciphering method, the Soroban method depends upon the expression for the cube of a binomial. Consider for example the number 12167. The first operation is to tick off in *threes*, that is in groups of ten-cubed. Now 12 lies between the cubes of 2 and 3. Hence 20 is the first approximation to the cube root of 12167. We have $12167 = 8000 + 4167$

$$= 20^3 + 4167$$

Now comparing this with the expression

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$
$$= a^3 + (3a^2 + 3ab + b^2)\, b$$

we see that we must form a divisor whose most important part is $3a^2$, that is, 3×400 or 1200. Using 1200 as trial divisor of 4167, we get 3, which corresponds to the b in the general expression. We now form the complete divisor by adding to 1200 the expression

$$3ab + b^2 = 3 \times 20 \times 3 + 3 \times 3$$
$$= 180 + 9$$
$$= 189$$

Thus we find as final divisor 1389, which multiplied by 3 gives 4167; and hence 23 is the answer required.

The method on the Soroban depends upon the following transformation of the binominal expression.

$$(a+b)^3 = a^3 + 3a\,(a + b + \tfrac{b^2}{3a})\, b$$

Here by dividing the remainder (after subtracting the cube of the first member) by that member and by 3, we obtain an expression whose principal part is ab, that is the product of the first member and the as yet unknown second member. Hence using a as trial divisor of the first figures of the prepared dividend we get b. In the process, the a or first member of the answer is set down in such a position relatively to the original expression that the b when it is finally evolved falls into its proper place succeeding a. We now subtract b^2 from its proper place in the remainder; and the final remainder obtained is $b^3/3a$. Operating upon this by multiplying first by 3 and then by a, that is by an exact reversal of the original process

of preparation, we get b^3 left. We shall illustrate the process by extracting the root of 12167 according to the Soroban method. The number is first ticked off by threes in the usual way, and the first member of the answer is set down on the first rod to the left of the highest triplet. In this particular example there are only two significant figures in the highest triplet, so that the 2 is set down two rods to the left of the first figure in the original number. The successive steps are as follows; and as position is of supreme importance in this operation, we shall symbolise the Soroban rods by ruled columns.

a.	2		1	2	1	6	7
b.	2			4	1	6	7
c.	2		2	0	8	3	1
d.	2		6	9	4	3	2
e.	2	3	0	9	4	3	2
f.	2	3			4	3	2
g.	2	3			1	3	1
h.	2	3				2	7
i.	2	3				0	0

a. Tick off into powers of 10^3 and consider the significant figures in the highest triplet, in this case 12. Two rods to the left set down 2, the highest integer whose cube (8) is less than 12.

b. Subtract 2^3 or 8 from 12; or, to be more precise subtract, 20^3 or 8000 from the original number.

c. Divide the remainder by the 2, which is the first found member of the answer. This, in accordance with the Soroban method of division, requires the the first figure of the quotient to be set down one rod to the left. Also it must be noted that the last *unit* is a fractional remainder and means really one-half.

d. Divide by 3, carrying out the process until the last rod with the ½ remainder is reached. To this unit the unit of the fraction one-third which appears a final remainder is added; so that the 2 on the last rod really means one-half and one-third. The division by 3 might be stopped at the preceding rod, so that instead of 69432 we should have 69411, in which the first unit means ⅓ and the second

$\frac{1}{2}$. There is greater chance of confusion, however, in this method than in the one shown, as will be seen when we come to the later stages.

e. Divide by 2, but stop when the first figure in the quotient, in this case 3, is obtained.

f. Continue this operation of division, regarding the newly obtained 3 as part of the divisor; or in other words, subtract 3^2 or 9 from the next place to the right. We have now left a remainder represented by 43 and $\frac{1}{2}$ and $\frac{1}{3}$. This remainder is of the form $\frac{b3}{a3}$; and to bring it back to a workable form we must multiply it by 3a. We must be careful, however, to do this so as to take proper account of the peculiar mixed fraction represented by 2 on the last rod to the right. The next two stages effect this.

g. Multiply by 3, beginning, however, at the second last rod, and thus undoing the operation *d*. Multiplication on the Soroban is accompanied by displacement to the right. Hence the product 3×43 or 129 has its last right-hand figure added to the rod containing the mixed remainder 2; and the final result of this operation gives 131, in which the last unit means as before one-half.

h. Multiply by 2, beginning with the second last rod, and thus undoing the effect of operation *c*. The product 2×13 or 26 is added to the 1, and the 27 appears as the final expression.

i. Subtract 3^3 or 27, and the remainder is zero.

Had we stopped in the operation *d* at an earlier point as suggested, we should have had to modify the reverse operation *g*. Thus, only the 4 of 411 would need to be multiplied by 3, giving of course 12 to be added to the first of the two units. The final result would have been of course 131, as already obtained.

As a further illustration of the method, let us take the case of a much larger number. It is required to find the cube root of 237,176,659. We shall divide the operation into two stages, the first of which corresponds with the simpler example already given.

a.	6	2	3	7	1	7	6	6	5	9
b.	6		2	1	1	7	6	6	5	9
c.	6		3	5	2	9	2	6	5	9
d.	6	1	1	7	6	3	3	6	5	9
e.	6	1	5	6	6	3	3	6	5	9
f.	6	1	1	6	9	9	2	6	5	9
g.	6	1	1	0	1	9	6	6	5	9
h.	6	1	1	0	1	9	5	6	5	9

a. Tick off the number in triplets beginning at the "units" place, and find the nearest complete cube to 237. It is clearly 216, the cube of 6. Set down 6 immediately to the left of 237.

b. Subtract 216 from 237.

c. Divide the remainder to the end of the next triplet by 6. It is unnecessary to go further in the division. Such an extending of the process would simply give unnecessary extra work in the reverse operations. The 2 in the last place of the second triplet is as before a fractional remainder and means *two-sixths*.

d. Divide by 3, manipulating the remainder as in the previous example.

e. Divide by 6 as trial divisor, giving 1 for quotient, and continue the division with 61. In other words subtract 1×61 from 117.

f. Undo the effect of *d* by multiplying 5663 by 3 and adding in the mixed remainder 3.

g. Undo the effect of *c* by multiplying 1699 by 6 and adding in the reminder 2.

h. Subtract 1^3 or 1 from 10196.

The final result then is 61 and a remainder 10195659, which must now be treated so as to obtain the third figure in the required answer. This second stage is exactly similar to the first stage after operation *b*. The steps are as follows:—

h.	6	1	1	0	1	9	5	6	5	9
i.	6	1	1	6	7	1	4	1	5	8
j.	6	1	5	5	7	1	3	6	7	8
k.	6	1	9				3	6	7	8
l.	6	1	9				1	1	5	8
m.	6	1	9					7	2	9
n.	6	1	9					0	0	0

i. Divide the remainder 10195659 by 61. The two last figures, 58, form a fractional remainder and mean 58/61.

j. Divide by 3, carrying the final fractional remainder 2 and temporarily adding it to the 5 of 58.

k. Divide by trial divisor 61 and continue with 619; that is subtract 9×619 or 5571 from 5571.

l. Multiply 36 by 3 and add the product 108 to the 7 of the mixed remainder, giving 11 and 58.

m. Multiply 11 by 61, adding in the remainder 58.

n. From this final result subtract the cube of 9 or 729. The remainder is zero, and the operation of extracting the cube root is complete.

It should be noted that the Japanese text-books regard *b* as the end of the first stage; so that each successive stage begins with the subtraction of the cube of the last found member.

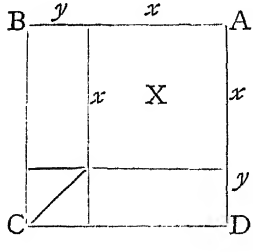
The process is of course capable of indefinite extension if the number is not a complete cube. With every new figure obtained, the operations become more difficult; but it seems almost that the Soroban method, done with Soroban, is on the whole superior in rapidity and accuracy to the ordinary ciphering method. The whole is superior in rapidity and accuracy to the ordinary ciphering method. The whole gist of the method is shown very clearly in the following transformation of the cube of a polynomial.

$$
\begin{aligned}
&(a+b+c+d+e+f+\ .\ .\ .)^3 \\
&\quad = \ a^3 \\
&\qquad +b^3+3ab^2+3a^2b \\
&\qquad +c^3+3\,(a+b)\,c^2+3\,(a+b)^2\,c \\
&\qquad +d^3+3\,(a+b+c)\,d^2+3\,(a+b+c)^2\,d \\
&\qquad +e^3+3\,(a+b+c+d)\,e^2+3\,(a+b+c+d)^2\,e \\
&\qquad +f^3+3\,(a+b+c+d+e)\,f^2+3\,(a+b+c+d+c)^2\,f \\
&\qquad +\ldots+ \quad \ldots \quad + \quad \ldots \\
&\quad = \ a^3 \\
&\qquad +3a\,(a+b)\,b+b^3 \\
&\qquad +3\,(a+b)\,(a+b+c)\,c+c^3 \\
&\qquad +3\,(a+b+c)\,(a+b+c+d)\,d+d^3 \\
&\qquad +3\,(a+b+c+d)\,(a+b+c+d+e)\,e+e^3 \\
&\qquad +3\,(a+b+c+d+e)\,(a+b+c+d+e+f)\,f+f^3 \\
&\qquad +\quad \ldots \quad + \quad \ldots
\end{aligned}
$$

In taking a general survey of the arithmetical operations as practised on the Chinese abacus, we cannot but be struck with their singular beauty and compactness. Once the meaning of the indications is understood, the operations of addition and subtraction are self-evident. Multiplication and division are of course in the first place repetitions of addition and subtraction. Thus if we wish to know how many times six is contained in 40, we have simply to go on subtracting successive sixes till no amount of the value of a six remains. We find we have to do this 6 times in succession and have 4 left after all; hence we say 6 out of 40, 6 times and 4 over. If we have this operation to perform frequently, it is of distinct time-saving advantage to stow it away in our memory. It is in this way that multiplication and division table have been found a practical necessity.

It has been already pointed out that the division table is a peculiar feature in the manipulation of the abacus as used in China and Japan. We have nothing corresponding to it in our western methods. With us the art of division is developed from a previous knowledge of the multiplication table. The mental process by which a beginner discovers how many times 38 contains 7 is to run up the multiplication table till a multiple is reached which is less than 38 by a number less than seven. Thus he finds 35, which is 5 times 7, and which differs from 38 by 3. With practice the finding of the necessary multiple becomes almost instantaneous; and the average school-boy is hardly conscious of the successive mental operations of multiplication and subtraction by which he effects division. With the Soroban worker, however, it is quite otherwise. He learns a division table of quite a conventional construction. In reality he learns the result of dividing the pure decade numbers by the simple digits; but instead of saying "seven into forty, five and five," he says "seven four, fifty-five." Such a convention, strange though it may sound, is peculiarly suitable for Abacus use. Upon it indeed may be said to depend largely the wonderful efficiency of the instrument. Exactly by what process of development the division table in its perfected form was evolved, is a problem which will probably never receive a solution; but it is clearly of purely Abacus origin.

The process for extracting square root and cube root, on the other hand, imply a knowledge of mathematics much wider than the abacus itself could ever teach. Square Root might perhaps have been evolved as a purely arithmetical operation on the abacus; but Cube Root certainly could not. It seems more reasonable to suppose that both processes were deduced by some more general mathematical method, either algebraic or geometric. The geometrical aspect is indeed most instructive. Consider for example the square A B C D, from which has been subtracted the small square X, whose side x is known in finite terms. The L-shaped portion measures the remainder after X has been subtracted from the large square. From this remainder we have to find the length y, which with x makes up the side of the large square. The line drawn from C to the contiguous corner of X evidently cuts the L-shaped remainder into two halves. And each half is made up of the product of x and y and half the square of y. Here we have at once the suggestion of the abacus rule for extracting square root. A similar consideration of the properties of the cube would lead to the abacus rule for extracting the cube root. It is not probable however that these rules were discovered in this way. They are rather to be regarded as having been deduced from general algebraic considerations, just as our own rules are. They involve a knowledge of the binomial theorem, not necessary in its complete generality, but so far at least as positive integers are concerned. It is known, however, that Chinese mathematicians have been acquainted for centuries with the binomial theorem, which they employed in the solutions of equation of high degree. Hence it is almost certain that the abacus rule for cube root is a formula deduced from the algebraic mode of solving such an equation as



$$x^3 - a = 0$$

The rule of course had to be formulated so as to suit the peculiar conditions of the arithmetic abacus. The discussion of what might be called the algebraic abacus or chessboard like arrangement for solving equations, is beyond the scope of the present paper.

PLATE I.

Symbolic Stage

The Hieratic Numerals

	1	2	3	4	5	6	7	8	9
Units									
Tens									
Hundreds									
Thousands									

Decimal Stage

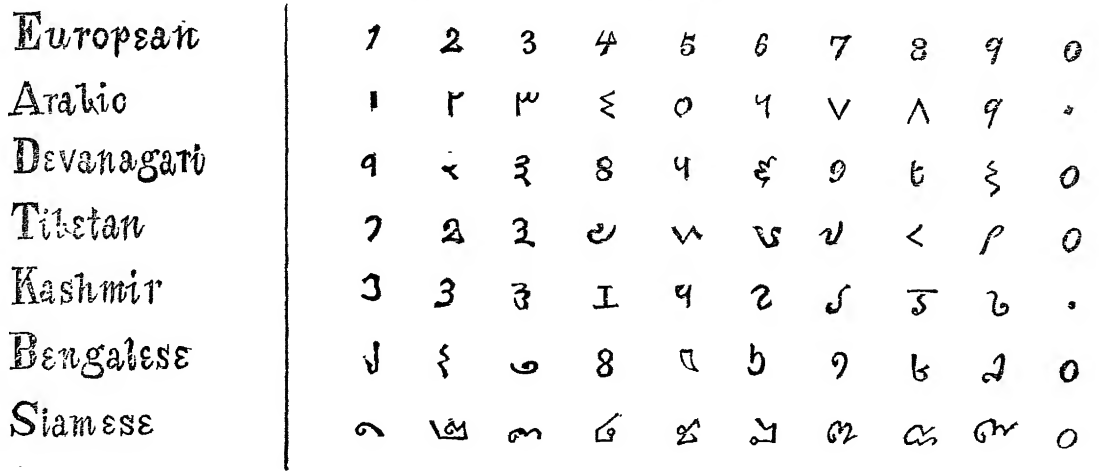
The Chinese and Tamil Numerals

	C	T		C	T
1	一		10	十	
2	二	2	100	百	
3	三		1000	千	
4	四				
5	五		26	二十六	2
6	六				
7	七				
8	八		734	七百三十四	
9	九				

PLATE II.

Cipher Stage

Various Systems of Numerals



BUDDHISM, AND TRADITIONS CONCERNING ITS INTRODUCTION INTO JAPAN.

By Rev. James Summers.

[*Read January 27, 1886.*]

Before bringing to your notice my translation of some short records relating to the introduction of Buddhism into Japan, it may be interesting to glance at the history of Buddhism as a whole; and I will endeavour to lay before you a brief statement of its origin and development in Asia, following the best authorities on the subject.[1]

A complete history of Buddhism has yet to be written. Such a history would cover a period of over two thousand years, and would include nearly all that was worth recording about half the human race: for, beginning in the 6th century B.C. in India, Buddhism has extended through all the countries of Asia excepting Persia, Arabia and a few insignificant regions inhabited by aboriginal races and hill tribes in India and the Malay Peninsula. Advancing into the deserts of Mongolia, it took the form of what is commonly called Shamanism;[2] penetrating the

1. Those who wish to read a concise and exact account of Budhism as it is known at present should refer to "*Buddhism, etc., by T. W. Rhys Davids, M.A., Ph. D., 12mo London,* S. P. C. K.;" and another work belonging to the same series on *Hinduism*, by Professor Monier Williams, of Oxford, will throw much light on the subject.

2. This term is derived from the Pali *Samana*, in Sanskrit *S'ramana*, which signifies 'an ascetic, one who has conquered the evil that is in him and by self-mortification strives to attain to Buddhahood.' One of Buddha's designations was "Samana-Gotama." In Mongolia, Tartary and the northern nations of Asia, Buddhism became overlaid and intermixed with the superstitions of the natives, and thus assumed a somewhat different form—in the more distant countries it lapsed into a sort of fetichism

mountain lands of Tibet, it appeared as Lamaism, which is only another form of Buddhism; then southward to Java in the 6th or 7th century A.D., where it has left the astounding monuments of Bōrō Būdūr to testify to its presence and influence there before Mohammedanism gained sway. Eastward it advanced to China, which it has permeated from end to end, and even to the present day forms a powerful agent in the civilization of that people—such as it is—for it is the only religion for the people in that vast country. From China Buddhism soon made its way to Corea, where, though in a decaying state, it has still considerable hold on the people.

When we contemplate the wide extension of this ethical system—originally a philosophy, and later on in place of a religion where votaries were often raised to high places in governments, became ruling powers in the state and always received the highest respect from the people, it is not too much to say that its history will involve the history of the peoples who accepted Buddhism in one form or other as their religious faith.

After many discussions and discrepancies regarding the date of Gotama's entrance into Nirvâna (i.e. his death), opinions about which have differed much in the various countries where Buddhism is professed, the date which has been as good as settled by the learned is B. C. 544. Roughly speaking he may be said to have been born about the beginning of the 6th century B.C., and was therefore a contemporary of Cyrus the Great, founder of the Persian Monarchy, and also of Confucius the Chinese sage. Some two hundred years after Gotama's death (B. C. 327) Alxander of Macedon appeared on the banks of the Indus and invaded the Punjâb, but retired before Chandragupta, ruler of the same kingdom in which Gotama was born.

It is unnecessary to repeat here the particulars relating to the birth of Shakya or Gotama, but I may be allowed to notice some other points, which are less commonly known.

Buddha's proper name is Gotama or Gâudama; his clan or family name was Shakya; hence he is often called *Shakya sinha*, 'the Lion of the Shakya tribe;' and *Shakya muni*, the 'ascetic of the Shakya tribe;' these as well as all other names are mere titles of significance given to

him subsequently by his followers. For example: *Buddha* is 'the awakened one, the wise one;' *Siddhara*, said to have been applied to him as a child, means: 'He who has accomplished his desire;' *Bhagavan*, 'the Blessed one;' *Jina*, 'the Conqueror;' *Dharmarâja*, 'the King of the Law;' etc.

He was born in Kapilavastu, which has been identified as Kohâna, situated about 100 miles north-east of the sacred city of Benares, on a small river which rises in the mighty Himâlaya some forty miles away. In his 29th year Gotama, after having been married to a king's daughter, who bore him one son, Râhula, suddenly deserted his home and became an ascetic; and, wandering among the mountains about Râjagriha, the capital of the Kingdom of Magadha, he sought for instruction in the Hindu philosophy from hermits living in the same wilderness; but finding their teaching unsatisfying to his enquiring spirit, he entered upon a course of self-mortification, up to a point at which he nearly succumbed and his companions thought him dead; moreover the discipline had failed and his former doubts and temptations returned. He was tempted to go back to his father's palace and to enjoy its pleasures, but after another season of spiritual struggle he won the victory and obtained Buddhahood;—became Buddha 'the enlightened,' one who had seen the vanity of vanities,—that all priestcraft and worship of idols and dependence on self-mortification was futile, and he had found that salvation by self-control and love for all creatures, without forms, was the only salvation to trust in. He declared to one of his first enquirers that he had overcome all worldly influences —ignorance and error, and passionate craving; moreover that his purpose was to *preach the Law* (lit. turn the wheel of the Law), give light to those in darkness and open the gate of immortality to men. But this expression "the wheel of the Law" has a deeper meaning; for the wheel *chakra* is related to Dominion, Rule, Kingdom, and the word 'Law,' *Dharma*, implies 'righteousness' and 'pattern,' 'example;' the term therefore may be considered to be equivalent to "Set up a kingdom of righteousness or righteous example," or "start the chariot of righteousness on its conquering course."

The gist of Gotama's teaching was: Love to and Pity for humanity and all living creatures, involving self-renunciation, with a view to effecting deliverance from sorrow and pain, which is produced by the continual change from birth to death in this world. After instructing his disciples only partially as they were able to hear it for some 20 years, in his 50th year he began to enter more fully into the deeper meaning of his doctrine, and so his teaching has been divided by his followers into two periods, calling the former—up to his 49th year the Partial or Semi-doctrine, and the latter from his 50th year the Full or Complete doctrine.

It was about the year 319 A.D., says the late learned Prof. Lassen of Bonn in his *Indische Alterthümskunde*, that the religion of Shakya Muni began to engage attention out of India. It was under the ban and persecution of the Brahmins in every country of India, but this was counterbalanced by its being spread into Further India, the Indian Archipelago, Thibet and China; whence it spread further to Corea and Japan, and probably to Mexico. About the year 400, Fahhien, the Chinese traveller, and his companions visited India, passing six years on the journey. They found Buddhism in India in a very flourishing state on the south side of the Cabul river and in Peshawur, where the magnificent sthûpa, by king Kanishka, told its own tale. The neighbouring monastery could accommodate 700 priests. Hiüen Tsang, another Chinese traveller, states that in the neighbourhood of the present Jellâlâbâd he found a sthûpa in which were relics of Tathâgata, i.e, the Buddha, kept and daily exhibited and worshipped with profound reverence. These relics were placed on dishes richly ornamented with precious stones, and to ensure the genuineness of the relics and to prevent their being tampered with, the ruler of the country had charged the chiefs of the principal families with the duty of opening the doors of the sacred place every morning, and after exposing the relics for the people's adoration, to see that they were replaced and the doors sealed with eight seals. On these occasions the people offered flowers purchased at shops in the neighbourhood. In a vale five journeys west of the city there was a sanctuary of Buddha, where Buddha's *Sanghâta* or double robe was exhibited for

the purpose of producing rain and other miracles of a similar character.

About the 8th and 9th centuries of our era Buddhism began to be overlaid with superstition, and the purity of Gotama's doctrines was beginning to be tarnished thereby. Even soon after his demise his teachings were warped to suit men's passions, and it was found necessary to hold Councils or Synods. We hear of one such held as early as 250 B. C. under the auspices of As'oka, the King of Magadha, which then included nearly all the countries of India. This champion and patron of the Buddhist faith has left enduring monuments of his good intentions in the shape of inscriptions on monoliths and rocks in different parts of India in a strange primitive character, undecipherable until the genius of Mr. James Prinsep read some of these in 1847. Others are being still found, and when these,—and also Chinese inscriptions (two dug out as late as 1882)—are fully deciphered, we may hope to arrive at more exact knowledge of the early history of Buddhism in India. By this same As'oka the Buddhist canonical books were arranged in what is called the *Tripitika* or '*Three* Storehouses—Repositories'. The first contains the *Sûtra*, supposed to be the very words of Buddha Gotama; the *Vinaya* or writings on Discipline for the instruction of Buddhist priests as well as the laity; and the *Abhidharma* or philosophical treatises for the learned. The two first divisions of the *Tripitaka* may be looked upon as the source of Exoteric Buddhism, while the third is probably the source of Esoteric Buddhism.

Passing over any further reference to the spread of the religion of Gotama in Mongolia, Thibet, India, Ceylon, and China, into the languages of which countries these standard classics of Buddhism were all translated, we come at last to the proper subject of this paper, the traditions as to the introduction of Buddhism into Japan.

I fear I have trespassed on the time of some by this long introduction, but I hope I may be forgiven for thus endeavouring to interest you in a subject about which our information is so scattered. The whole subject is a very large one and commends itself to those who have leisure to pursue it. It should be especially interesting to those members of our society whose duty it is to proclaim Christianity to Buddhists to enquire into the subject, both

from a general point of view as well as it appears to us in its development in this country.

Buddhism has ever shown an adaptability to the circumstances in which it has found itself, and therefore in the study of any particular phase of Buddhism we shall be studying the character and idiosyncracies of the nation which professes it.

It is generally understood that Buddhism was introduced into this country through Corea, and the native accounts of it accord in a great degree. Those who desire to see some further particulars may refer to some notes on Ōsaka which I had the honour to lay before this society some years ago (see Vol. VII. p. 392). The translations which follow are a similar character, but more extended, being the free translation of a short paper entitled 佛法傳來 *Buppō den rai*, to be found in the 法華靈驗記 *Hokke rei jō ki*.

From this work it appears that in the 16th year of Keitai Tenno (an emperor who reigned in Japan from A.D. 507-551), that is in the year 523 A.D., a certain person named Shibatattō 司馬達等 came to Japan from Nanryō 南梁 in China and resided at Sakatabara 坂田原 in the district (kōri) of Takaichi in the province of Yamato.

There he set up a thatched house (hall) and in it an image of Buddha, dwelling there himself, and worshipping, yet our people not being able to understand clearly the hature of Buddhism simply called the figure "the God of the Foreign Country," and as they did not at all believe in the doctrine, Soga no Bashi came shortly afterwards and discoursed with Shibatattō upon the religion of Shaka, and after that the people comprehended what Buddhism was. As in course of time beliefs in and respect for the religion of Buddha extended, and in the 13th year of the Emperor Kimmei 欽明 A.D. 612, the messenger of the previous year in the suite of Kafuka, the minister, returned with a commissioner, the Tai-fu Sei-hō-ki, from the King of Corea, Sei-mei 聖明, with tributary offerings of a copper image of Shaka, and a stone image of Miroku. The Emperor of Japan addressed the assembled ministers in council, saying: these Buddhist figures have been presented to us; what is your opinion about them? Then the Minister Soga no Iname said: All countries come and pay their respects and do homage to Japan. Is it not so? And therefore we should treat them with respect. But Nakatomi no Miiko,

the father of Kamatari, proceeded to argue, saying: this kingdom of ours is divine, and we worship one hundred and eighty gods: now why should we worship these foreign gods? The high officers present agreed that further argument was waste of time, but that the articles of tribute offered by King Mei could not be returned, and that Iname the minister of state should be requested to take charge of them. He first placed them in his house at Oharada, and afterwards removed them to his own house at Mukuhara, which thus became a temple, and was called Kō-gen-zi 向源寺. This was the first instance of a Buddhist temple being erected in Japan; then it was inaugurated and rules were established regarding times of fasting, and Shibata invited the offerings of the faithful. But as Tattô was merely a common person explaining the Law of Buddha, those who came to hear had some doubt about it; then Tattô being inspired produced among the rice used in sacrifice a small relic (*shari*) of Buddha, and this he presented to Umako (i.e. Bashi), who being still in doubt took a metal hammer to break the relic; he found, however, that it could not be broken; on the contrary, it left a hole in the hammer. Having yielded to this strange miracle, all the ministers now became in favour of Buddhism.

When Shotoku Taishi was born, a precious relic of Buddha was found in the infant's closed first. Notwithstanding this, few believed; still this was the first case in which there was a proof of its reality.

Again in the 1st year of Shushun Tennō, there was another importation from Corea.

Again in the reign of Kimmei Tennō, in the 14th year, fifth month and 1st day, in the province of Kawachi in the district of Idzumi, a brilliant thing appeared, to wit: there was seen by an imperial commissioner a piece of wood (Kusunoki) floating on the sea. Its brilliancy was like that of the sun. It was taken out and respectfully offered to the Emperor, who commanded a Buddhist artificer from Corea to carve this tree into two figures. This was the first example of Buddhist images being carved in Japan.

After this, although there were those who believed and revered the Buddhist faith, images were difficult to obtain. But in the 6th year of Bidatsu Tennō, Buddhist artificers and architects were invited to come from Corea to

Japan. This was the first introduction of Buddhist carvers into our country. Henceforth the doctrine spread every where and very many believed. However, in the 14th year of the reign of the same Emperor a great epidemic or plague broke out, and very great numbers of the people died. Then Moriya Katsumi and his party proceeded to break up the Buddhist faith introduced by Sochi, and they attributed the great calamity entirely to the judgment of the gods on the nation for introducing it.

Soon afterwards an imperial order was issued by which Buddhism was interdicted. About this time Moriya likewise had the images of Buddha burnt and the remains thrown into the *Naniwa no ye* 難波江, (the river Yodo at Ōsaka). Henceforth Buddhism declined and Buddhist books were on the one hand (i.e. by some) received with pleasure on the other (i.e. by others) disliked.

Still after another eight or nine years had passed, during the reign of the Empress Suiko, the heir apparent, Toyomimi having an imperial order, again extended the doctrine of Buddha widely, and with this Imperial mandate in union with many of the high officers of the court he had a temple built in honour of Buddha.

We may say then in a general way that Buddhism in Japan from this time began to flourish, still Buddhist places of worship gradually increased, and were either in private houses or being built in the grounds of private gentleman and took various temple names, and when the spirit of Buddha had become settled therein afterwards, these places of Buddhist worship received an imperial dedication and so became recognized by the Emperor, and so they have continued for a thousand years.

However, although they may have been destroyed by the elements and catastrophes in nature or the calamities in time of war, still Buddhism has naturally continued to flourish up to later ages.

In the time of the Empress Suiko (593) a priest of Corea named Kanroku came and presented to the Empress books on almanac making, astronomy and geography. In the 12th year of her reign almanacs were first used.

In her reign the prince Shotoku, who was a great admirer of and believer in Buddhism, exerted himself to extend its doctrines, so that from this period it became prominent in this country.

PAST PARTICIPLE OR GERUND?—A POINT OF GRAMMATICAL TERMINOLOGY.

By Basil Hall Chamberlain.

[*Read January, 27, 1886.*]

If a grammatical term, though incorrect or inadequate, has been sanctioned by universal usage, the best plan is to retain it. Thus to attempt to change the misleading names of some of the cases in Latin would cause general inconvenience without any counterbalancing benefit; for these names have been for centuries in the mouths of all scholars, and can no longer mislead those who think for a moment on the subject. But where usage is neither ancient nor universal, and where the language is one that is little known, the circumstances are very different. It then behooves those who have any influence on the selection of grammatical terms, to make that selection as carefully as possible. The advantages of a clear and appropriate terminology are so patent as scarcely to need insisting on. There are advantages to the student of the particular language in question, and there are advantages to the comparative student of many languages, who is unavoidably led or misled in his judgments and classifications by the terms which he finds used to denote the phenomena of the languages which it is his object to compare. Thus if we adopt, as some European grammarians have done, the inappropriate term "*root*" to denote such inflected verbal forms as the words *iri*, *ire*, *irenare*, and *iresase*, we on the one hand give the student of Japanese a mistaken notion both of Japanese roots and of Japanese inflections; and on the other hand we mislead the comparative philologist at home, whose knowledge of Japanese is necessarily derived merely from European books, into removing Japanese from the Altaïc family of languages in which the root is never used as an independent word, and into classing it (most probably erroneously) elsewhere.

For the retention of any such erroneous terms there is not in the case of Japanese the excuse of long-established usage. The Japanese themselves only began to study grammar during the eighteenth century; and each succeeding native writer has used complete liberty in rejecting such of his predecessors' technical terms as seemed to him unsatisfactory. The chief European writers on the subject, from Rodriguez to Mr. Aston, have acted much in the same manner, with the result that a generally acceptable terminology, the chief share in which belongs to Dr. Hoffmann and Mr. Aston, has now been formed. But it is by no means too late to add some finishing touches, to correct erroneous or inadequate terms.

A few months ago I ventured to propose "indefinite form" as a substitute for the misleading term "root." I now wish to ask those who are interested in Japanese grammar to drop the scarcely less inappropriate term "past participle," used to denote the verbal form in *te*, as in *mite*, *irete*, etc., and to use the term "gerund" instead. The Japanese themselves have no name for the form in question. But "gerund" was the designation used by the late Dr. Hoffmann and by the late Dr. Brown, and I hear from Mr. Satow that he too supports its use.

Etymologically the form in *te* appears to be connected with *tsu*, *tsuru*, *tsure*, supposed by the native grammarians to the derived by aphæresis from *hatsuru*, "to finish," and used as suffixes denoting completion or past time. Even apart from this etymology, which may or may not be correct, the form in *te* seems primarily to denote past time. Thus, to take Mr. Aston's examples:

Haru sugite, natsu kitaru, Spring having passed, summer comes.

Hana sakite zo, hito mi ni kuru, It is after the flowers have opened, that people come to see them.

Ikusa mite, ya wo hagu, Having seem the battle, to whet one's arrows, i.e., To whet one's arrow after the battle has begun.

But in practice this form in *te* so frequently refers to present time, that the term "*past* participle" fails to give an adequate idea of its character. The usage of the form in *te* with regard to time is stated with such clearness by

Motoori in his "*Kotoba no Tamanoo*," Vol. VI, page 20, *rev.*, that the passage may here be quoted with advantage. He is comparing the terminations *te* and *tsutsu* with reference to such passages as—

Hana mitsutsu
Hito matsu toki wa
Shirotae no
Sode ka to nomi zo
Ayamatare-keru,

and—

Au koto wa
Kumoi haruka ni
Naru kami no
Oto ni kikitsutsu
Koi-wataru kana,

after quoting five of which, he continues: "*Migi no tagui no* tsutsu *wa* te *to iite mo yoroshi. Tadashi* te *wa hiroku,* tsutsu *wa sebashi. Saru yue ni* tsutsu *to iu-beki tokoro wo* te *te iwaruredomo,* te *to iu-beki tokoro wo* tsutsu *to iite wa kanawanu koto ōshi. Somo-somo* te *wa hiroku,* tsutsu *wa sebaki yue wa, hitotsu no tameshi wo mote iwaba, 'Oto ni kiki*te *koi-wataru' to iu wa, mazu oto ni kikite, nochi ni koi-wataru ni mo ii, mata oto ni kiku to koi-wataru to onaji toki ni ai-kōru ni mo iu nari. Shikaru wo, 'Oto ni kiki-*tsutsu *koi-wataru' to wa, oto ni kiku to koi-wataru to onaji toki ni ai-kōru ni nomi iu kotoba nite, mazu oto ni kikite, nochi ni koi-wataru ni wa ii-gatashi,*" i.e. "In passages like those just quoted, *te* might be substituted for *tsutsu*. It should be noted that *te* is of wider, and *tsutsu* of narrower application, for which reason *te* may be substituted for *tsutsu*, but *tsutsu* can by no means always be substituted for *te*. As an example of the wider application of *te* and the narrower application of *tsutsu*, take the phrase '*Oto ni kiki*te *koi-wataru.*' This may be used either to express the fact that the sound was heard first and the love felt afterwards, or that the sound was heard and the love felt simultaneously. On the other hand the phrase '*Oto ni kiki*tsutsu *koi-wataru*' is used only to express the fact that the perception of the sound and the feeling of love were simultaneous, and never to express

the fact that the sound was heard first and the love felt afterwards."

So positive a statement by so great an authority must surely decide the question. For though the etymologies of the Japanese grammarians are often wild and their classification faulty, their testimony on points of usage, and Motoori's testimony in particular, will be deferred to by all foreign students as being beyond dispute. A few examples are appended at the end of this paper, which will serve further to illustrate the matter.

I now pass on to the second count in the indictment against the objectionable term "past participle." We have disposed of "past." Let us now dispose of "participle." "Participle" is a term felicitously chosen to denote those words in Western languages which participate alike in the nature of the verb and of the adjective. Thus in the phrases "a child loved by its mother," "a man possessing great talents," the words "*loved*" and "*possessing*" are participles, because they indicate an action after the manner of a verb, and at the same time define a noun after the manner of an adjective. Written Japanese is peculiarly rich in words of this class, each tense of the indicative Mood, whether affirmative or negative, passive, etc., having a form answering to the European idea of a participle. In the Tōkyō colloquial the participle of several tenses has alone survived, replacing the verb proper. We do not, it is true, here generally call these words participles, because various reasons founded on the structure of the language make it more convenient to denote them by the term "attributive form." But in the European sense of the word, and viewed from the standpoint of the comparative philologist, they are participles. Thus in *kuru hito*, a "coming person;" *kishi hito*, "a came person," i. e. "one who came;" *konu hito*, "a not-coming person," i e. "one who has to come," the words *kuru*, *kishi*, and *konu* are respectively the affirmative present, affirmative past, and negative present participles of the verb *kuru*, "to come."

Now the form in *te*, called by some the "past participle," is precisely one of those verbal forms which does *not* thus participate alike in the verbal and in the adjective character. Such forms as *kite*, *mite*, *sakite*, *sugite*, can never be used to define nouns, and are

therefore not participles in any sense that can properly attach to that word. Perhaps there is no European grammatical term exactly covering the manifold senses in which the Japanese verbal form in *te* are used. But the word "gerund" appears to me to be open to less objection than any other, and, as already stated, it has the sanction of the authority of Dr. Hoffmann, Dr. Brown, and Mr. Satow. It has at least the merit of denoting one of the several senses in which the form in *te* is used, viz. the causal sense (*by* doing, *by* having done), whereas the term "participle" gives a fundamentally false notion of its structure and function.

The following examples are appended for the sake of reference:

Kotaete iwaku, "He answering said," "He said in answer,"—the answering and the saying being of course synchronous, because identical with each other. *Kotaete* is therefore present, not past.

O soba ni tsutomete iredo, "Though we *are* in atttendance on his person." (The "being" and the "attending" being necessarily synchronous.)

Shite morau, "to get a thing done for one" (present, the actions represented by the two verbs being synchronous).

Ashi wo ugokashite yuku, "I go [by] moving my legs." The speaker does not mean that he moves his legs first and goes afterwards. The two actions are synchronous, one being the instantaneous result of the other.

Muyō no sho wo arawashite, uyō no sho wo aganau (a saying of the voluminous novelist Bakin), "By publishing useless books, I am able to purchase useful ones."

Ran wo uete tanoshimu mono, "Those who take pleasure in planting orchids."

A LIST OF WORKS, ESSAYS, ETC., RELATING TO JAPAN.

COMPILED BY CARLO GIUSSANI.

[*Yokohama, March, 1886.*]

[NOTE.—The works marked with an asterisk are only partially devoted to Japan.]

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THE ART OF LANDSCAPE GARDENING IN JAPAN.

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[*Read May 5, 1886.*]

Fidelity to nature in Japanese gardening.

No art in Japan has been followed with greater fidelity to nature than that of Landscape Gardening. There are numerous arbitrary rules and quaint conceits connected with this art, but the results achieved invariably possess the merit of natural picturesqueness, such artifice as is resorted to not unduly asserting itself, but only contributing unobtrusively to effects apparently artless. Whilst supplying the materials with which the landscape gardener constructs, nature also serves him as a model in arrangement and distribution. In this respect the principles adhered to contrast somewhat with those followed in Europe, and in order to duly appreciate the contrast it will be interesting to consider briefly the chief characteristics of Western horticultural arrangements.

Contrasts between European and Japanese gardening.

Landscape gardening as practised in Europe is subjected to greater formalities of design than in Japan, and in theory it harmonizes less closely with the features and disposition of real scenery. It is more of a science and less of a fine art than in this country. The French gardens, which are noted for their magnificence, are remarkable for their adherence in plan

to geometrical lines and symmetrical arrangements. General flatness of level, straight walks distributed in parallel or intersecting right lines, lawns and water basins of regular figures, flower beds and shrubberies of geometrical patterns, and formal avenues and plantations of trees are some of the principal features of such gardens. Examples of the same type are numerous in England; but generally speaking our gardening is characterized by greater variety and less adherence to mechanical forms, and this distinction has on the continent obtained for the English method the name of the *Natural style*. In this style, undulations in level are admitted, pathways wind and interlace, and lawns and plantations are disposed with studied irregularity. Stricter geometrical treatment is, however, introduced in the form of a terrace or parterre immediately in conjunction with the residence. This subordination of a part, at least, of a garden to the lines of the building which it adjoins is an important principle in European gardening generally, and is insisted upon by practitioners and writers alike. "Large or small," says a well known art critic, "a garden should be both orderly and rich. It should by no means imitate either the wildness or the willfulness of nature, but should look like a thing never to be seen except near a house." Houses being objects exhibiting formal and geometrical lines, it is maintained that such lines should be repeated to a greater or less extent in the adjoining garden in order to produce an appropriate combination.

Subordination of lines of European gardens to the building.

The same regularity which is followed in the general arrangement of European gardens is also applied to the details. Trees and shrubs are often selected for their uniformity of size and shape, and are grouped in equidistant rows and phalanxes. Flowers are planted in geometrical patterns of colour,

Regularity in details.

often resembling the arrangements in a kaleidoscope. It is not long since the custom prevailed of shearing trees in a manner quite at variance with their natural growth, and even cutting them into such forms as verdant statues, rampant lions and tea-cups. Architectural ornaments, such as balustrades, vases, and statuary, are largely introduced, with the object of adding to the artificiality of the garden and connecting it still more with the building which it adorns. The garden in short is made as much a stage for fashion and social conventionalities as the reception rooms of the mansion itself.

Architectural ornaments used to connect garden with the building

Luxury and display being everywhere required, the Western horticulturist includes in one design botanical specimens from all parts of the vegetable kingdom. The perfection to which the details of horticulture, as applied to exogenous plants, has been brought in Europe is certainly unapproached in Japan. The careful acclimatization of rare and tender plants, and the cultivation of tropical trees and fruits is here almost unknown. A complete European garden becomes a repository for collections of rare and beautiful specimens from all parts of the world—in fact a sort of museum of horticulture. As an encyclopedic science of this kind, Japanese landscape gardening can make no boast, but the absence of such artificial refinements is considerably to its advantage as a fine art. Just as a mixture of heterogeneous elements is destructive of æsthetic harmony in architecture, painting, or music, so must it necessarily be in the artistic composition of gardens. Constructing only with materials native to the country the designer is able to follow consistently the arrangements suggested by nature, the landscapes he seeks to reproduce being in all cases identical with the natural types that are familiar to him. He is not tempted by

Use of exogenous trees and plants.

Heterogeneous elements destructive to art.

the use of exogenous products, with the real distributions and surroundings of which he is unacquainted, to create artificial and hybrid combinations.

Heterogeneous character of garden architecture in Europe.

Again, the European landscape gardener further embellishes his grounds with architectural constructions of most heterogeneous character. Greek temples, ruined arches, funereal urns and monuments, obelisks, rustic cottages, Italian bagnios, Turkish kiosks, and Chinese bridges are capriciously interspersed in the most celebrated gardens. All forms associated, in poetry or romance, with the picturesque and the fantastic are introduced with very little regard to congruity or appropriateness. Such eclectic principles contrast in a marked manner with the purely native character which pervades the designs of Japanese horticulturists.

Simplicity of Japanese gardens.

Superior grandeur of European gardens.

It must undoubtedly be acknowledged that the gardens of this country are on a scale far less imposing than those of the West. There is little here to compare in gardens to our spacious English parks, with their wide, grassy slopes, tree-bordered lakes, broad drives, avenues, and limitless expanses of verdure. We miss here, too, many legitimate features of the art as practised in Europe. The Japanese artist confines himself to narrower and humbler lines, but it must be recognized that within his limits he produces results unrivalled in natural beauty and loveliness.

Unnatural regularity avoided in Japanese gardening.

In the native landscape gardening, unnatural regularity is generally most studiously avoided, but the variety obtained is the result of well considered arrangement and by no means that of hazard. Contour, form, and proportion receive primary attention, and combinations of colour follow rather as a natural result than as a premeditated arrangement. The fundamental difference between the Japanese and foreign methods

of adjusting culled flowers has been often remarked. With us the general idea is to produce a bouquet in which the richest variety of colour can be obtained—a sort of crush concert of hues in which individual form and beauty are almost lost. The Japanese florist on the other hand prefers to display the natural lines of stems and branches, and to exhibit the subtle shapes and colours of each bud and blossom in an open and well balanced composition. The same subordination of colour to form and the same simple naturalness as opposed to ostentatious artificiality are to be observed in even the minutest details of Japanese gardening. Grouped masses of similar flowers are not wanting in some parts of the native gardens, but there is no attempt to arrange them into colour patterns and geometrical designs.

Subordination of colour to form.

Gardening, like certain other peaceful arts in Japan, is said to have first become seriously cultivated as an art during the regency of the famous Ashikaga Shōgun Yoshimasa (1449-1472). The same tranquil and prosperous times which advanced so considerably the literary arts of poetry and penmanship, and which first stimulated the cultivation of the polite tea ceremonies, also brought patronage to the art of the landscape gardener. The æsthetical arrangement of gardens became in fact one of the most important accessories to the refined pleasures of the *cha no yu*,[1] and the name of Shosetsusai Sōami, a famous *cha jin*[2] of this period, is associated with these early horticultural designs. The theory of landscape gardening, like that of the tea ceremonies, was introduced from China, though in its later developments it diverged considerably from the style followed in the latter country. The gardens of China, as they exist at present, abound more in little kiosks and balustraded

History of Japanese gardening.

Derivation from China.

Differences in Chinese gardening.

[1] Tea-drinking ceremonies. [2] Professor of the tea-drinking cult.

galleries; they have large complicated rockeries honeycombed into caves and grottoes, and are more profusely decorated than are the Japanese gardens with flowering plants. The stone lanterns and miniature stone towers or *pagodas* found in the gardens of this country appear to be of purely Japanese invention.

Gardening previous to the fifteenth century.

It can hardly be supposed that until the middle of the fifteenth century the Japanese were unaccustomed to introduce horticultural arrangements into their grounds. Fine monasteries, temples and palaces had existed for many centuries before, and were surrounded by plantations which remain to the present day. It is rather to be inferred that the principles of gardening first became theorised in the time of Yoshimasa, and that rules were then established bearing more especially upon the severer type of composition suited to the gardens of literary recluses.

Historical examples.

Such ancient gardens as that of the Ginkakuji (Silver Pavilion) in Kyōto, and those constructed in the compounds of many old conventual establishments, some of which with their aged trees and moss-covered rocks look like the handiwork of primeval nature, remain as a testimony of the skill of the early designers. These masterpieces have served as models for later artists, and the chief differences in execution which more modern practitioners have introduced consist merely in a more servile adherence to traditional rules. The theory of the art as it is to be found in books is enveloped in an accumulation of abstruse terms, secret meanings, fancies, and superstitions, which render it highly complicated. Punctiliousness in the smallest matters is one of its principal characteristics. As is well known, most of the arts and trades of Japan have been handed down traditionally through the medium of apprenticeship and kept with some secrecy from the outer world. Such

Native books on gardening.

books as are published are often purposely made incomplete and vague, with a view of puzzling the uninitiated student. The information which they contain is often condemned by practitioners as the writings of people with but little practical knowledge. Whether that accusation against such works upon Japanese gardening as have been consulted in preparing this paper be true or not, it is difficult to say, but so much that is interesting and instructive has been found in the midst of a good deal that is quaint and abstruse, that the results have at any rate seemed worth recording.

Theory.

First as regards the theory of Japanese landscape gardening. It is usual to divide garden compositions into three styles expressive of their general character. These divisions are called Shin, Gio, and Sō, which in the present context may be translated as Finished or laboured style, Intermediate style, and Free or bold style.

Three styles, Shin, Gio and So.

In practice these styles are not sharply divided, but a garden according to its rough or elaborated character may generally be classed under one of the three heads. The styles most often employed in modern times are the Sō and Gio, the Shin or highly elaborated style being less often resorted to. The above classification refers only to the manner, free or delicate, which is exhibited in the composition, and to some extent in the nature of the materials used, and it is an important law that whatever character is decided upon, it should be consistently followed throughout. A mixture of two conflicting styles would necessarily produce incongruous results, and the scale and harmony of the composition would be destroyed. There are other guiding principles which the landscape gardener applies to his designs, such as suitability in character to the pursuits and rank of the proprietor

Consistency in style is necessary.

Character of a garden.

for whom he constructs, and the expression in his compositions of some predominating sentiment. The garden is regarded as a poem or picture intended to arouse particular associations and inspire some worthy sentiment.

Sentiment in a garden.

Sometimes the suggestion of some natural scene of mountain forest or river may be intended; sometimes a purely abstract sentiment is to be conveyed, such as the idea of patient retirement from the world, meditation, or ambition. If, for example, a garden be designed for a poet or a philosopher, its general disposition should express dignified seclusion, solitude, virtue, or self-abnegation. The habit of regarding a garden as an ornamental appendage to a building, and constructing it with a view of boasting rare collections of plants and stones and making a display of wealth, is much condemned by Japanese writers as leading invariably to an effect of vulgarity.

Love of nature and absence of ostentation.

Gardening, it is said, should be undertaken from a genuine love of nature and with a desire of enjoying the beauties of natural scenery, and gardens should be so arranged that the four seasons may each contribute in turn to their artistic excellence. They should be pleasant retreats for hours of leisure and idleness; and, as one writer has poetically expressed it, "places to stroll in when aroused from sleep." The ethics of the art as thus propounded are undoubtedly of a high order. In western designs the idea of displaying wealth and luxury is paramount, and our gardens are principally regarded as resorts for the pleasures of society and fashion; whereas in Japanese gardens the prevailing intention is rather that of a place exempt from public haunts and fitted for unrestrained ease and meditation. Among the various sentiments which the horticultural artists have professed to express in their works, the following may be

Various sentiments suggested in gardens.

enumerated: The Happiness of Retirement, Long life and Happiness, Modesty, Fidelity, Peace, Gentleness and Chastity, Connubial Felicity and Old age. In the main these fanciful conceits rely for their perception upon the shades of emotion aroused in all by natural scenery—be it awful, placid, gay, or solitary, such emotions being inspired differently in different men according to their particular culture and temperament. Their value is however largely dependent upon occult meanings, historical or philosophical, which are associated with many of the arrangements followed, and which those unacquainted with Japanese history and philosophy cannot of course appreciate. More especially is this the case in connection with the gardens of religious buildings. As an example may be named the garden attached to the Abbot's Palace at Tokuwamonji, specially designed to convey an idea of the "power of Divine truth." This garden consists almost entirely of stones arranged in a fanciful and irregular manner in a small enclosure, the sentiment expressed depending for its value upon acquaintance with the following Buddhist legend, somewhat reminding us of the story of Saint Francis and the birds. A certain monk Daita ascending a hillock and collecting stones began to preach to them the secret precepts of Buddha, and so miraculous was the effect of the wondrous truths which he told that even the lifeless stones bowed in reverent assent. Thereupon the Saint placed them upon the ground around him and consecrated them as the "Nodding Stones."

Example of historical motive.

This may be taken as a fitting, though perhaps an extreme instance of a sentiment appreciable only by means of historical association, and as an example of what has been referred to as philosophical meaning may be mentioned another design professing to express "connubial felicity and longevity." This latter idea

Example of philosophical motive.

is conveyed by means of a picturesque old well in the centre of an otherwise bare enclosure, surrounded by a few appropriate shrubs and stones. Water, being the nourisher and preserver of all living creatures, has been taken in this case to suggest the intended idea.

Practice of designing gardens.

Passing from theory to practice, there are a few general principles laid down as a guide to the designing of landscape gardens. As a preliminary education it is necessary to take every opportunity of visiting good scenery and of making notes and sketches. These sketches cannot of course be closely followed in preparing designs, but will supply suggestions and lead to originality in composition. Considerable practice is necessary in observing and sketching scenery for the purpose of applying it to the art of garden-making. Any attempt to copy in entirety an extensive and complicated view must end in failure and confusion. Having obtained a good subject for sketching, the best method is to consider the scene in parts and study separately the contours and peculiarities of these parts. Thus, observing as much of the view immediately in front as can be fully taken in from one point of sight, the several striking contours of hill, stream, rock and valley, with the forms of the principal trees both in foreground and distance should be sketched. Then turning a little to the left, sketch those forms which now appear most striking, in the same way, and repeat the same process on turning to the right.

Sketching as an aid to designing.

The training to the eye and hand thus acquired is invaluable, and the sketches themselves are of no small value in providing suggestions for the preparation of designs upon paper; but such designs, as well as the sketches from which they are made, can only form a general guide for the subsequent execution of the

work. The detailed elaboration is subject to constant variations; such variations being governed principally by the accidental facilities of the site and the nature of its surroundings, and secondarily by the size, form and character of the stones, trees, and lanterns which can be collected as materials to work with. Any attempt to follow too closely the details of a real scene must result in a false and unsatisfactory appearance.

Execution subject to variations.

Certain rocks and boulders, for example, which in nature are stable and which satisfy the mind as such by means of their immense size and age, would, if artificially imitated on a small scale, produce unstable and *bizarre* results. In gardening, as in other arts, an effect of repose should above all be aimed at.

Before proceeding to execute a landscape garden, a careful survey of the site and its surroundings is necessary. If it be a bare and level area, the designer, is free to arrange his composition in any way that he may please, according to its size, bearing in mind the locality, surroundings, and the character of garden suited to the particular proprietor. But if it be a site possessing natural facilities, such as fine trees in prominent positions, hillocks, a stream, or even a natural cascade, the artist will consider how such natural features can be utilized and worked into his design. Similarly, a neighbouring view may be cleverly taken advantage of, and the garden so arranged as to harmonize with it, the distant landscape when seen from the rooms of the house actually appearing to form part of the whole composition. Aspect must be considered as well as prospect, and a high wooded bank forming a boundary to the north or north-west of a garden site is a great natural advantage, as is also a picturesque open view to the south or south-east.

Survey of proposed site.

Utilizing a neighbouring view.

The aspect of a garden is important.

Adaptation of existing features.

If a garden be made in a place where fine trees already exist, other trees of the same character should be planted beyond them, so that they may naturally blend into the whole composition. The same rule should be followed with regard to any existing rocks or boulders of a picturesque character; they should be utilized and "supported" by additional stones arranged so as to compose well with them and connect them with the rest of the artificial scenery introduced. In taking advantage of a neighbouring view in order to impart the idea of expanse to a garden, it is a good plan to plant in the garden some of the same kinds of trees as can be seen in the distance, the heights of these trees being gradually lowered so as to lead the eye by degrees to the scale of the distance, and harmoniously unite the whole. Just as in landscape painting, so in garden designing, conflicting rules are laid down by different professors of the art as to the part of the composition which should be first worked upon. Some writers hold that the foreground should first be finished, others assert that the distant portions should receive primary attention. All agree that the mid-distance or central area is subsidiary and should be finished last. The best method is no doubt that recommended by one author, of roughing out at the same time and improving alternately step by step both the foreground and the distance; for though it is universally admitted that the background or distance takes the rank of first importance in the landscape, its true value is best secured by accommodating it in every way to the features of the foreground.

Relative importance of different parts of garden.

Rikiu's method.

The system of composition taught by the renowned "*chajin*" Rikiu was that of planting the large trees in the front part of the garden and lower ones in the further parts, thus adding to the perspective of distance. In the same way Rikiu taught that, the

hinder hills should be lower than the nearer ones, and distant water higher towards the background. This was called the *Distance lowering method* (*saki-sagari*).

Another famous authority named Oribe advised an exactly opposite treatment, called *Distance raising* or *saki-agari*. He recommended that the larger trees and higher hills should be placed in the distance, and that objects should be gradually lowered towards the foreground. Rikiu's theory as to the disposition of trees and water in an artificial landscape seem admirable, but the idea of lowering the distant hills seems contrary to the more general effects of natural scenery, where the distant mountains from their proportionate size overtop the lower and nearer hills. Supposing the garden hills, however, to represent prominences of similar magnitude, or even supposing that we are regarding scenery from the mountains towards the plains, in either of these cases Rikiu's theory of hill composition seems quite tenable.

Oribe's method.

Great care is recommended in considering the scale of a garden. If a small garden be arranged on the same plan as a larger model, it will look weak and unsatisfactory; and in a similar way, if a large garden be designed upon the lines of a smaller model it will loose all its grandeur. For example, the arrangement of two or three large rocks in front of a clump of fine trees in a large garden will look more imposing than a greater number of smaller ones. Multiplicity of detail within a small compass is however necessary in a little garden in order to give it interest and add to its apparent scale.

Scale of a garden to be carefully considered.

It must be borne in mind that a garden is above all a place for summer enjoyment. During the winter, but limited amusement can be expected from it, and an attempt to import much interest into it during the colder months will be to its detriment as a summer

Effect of coolness in a garden.

retreat. A garden must therefore by all means look cool and refreshing, but such coolness is not produced by planting trees too densely and crowding the area with many objects. A few masses of foliage judiciously arranged in the background can be made to impart a fresh and cool effect. The presence or the suggestion of water is necessary, but it must be remembered that clean, shallow and running water looks much cooler than deep, stagnant or weed-covered pools. The total absence of litter and untidiness added to the presence of water produces the most refreshing effect. A garden therefore should have large open spaces cleanly kept, with stretches of white sand or gravel in the foreground and moss in the background.

The presence of clear water is productive of cool effect.

Having considered the general æsthetic codes which should guide the landscape gardener in his work, we may pass on to study the particular features of his designs. In large compositions the distribution of contours and areas demands the first attention. In some cases advantage will be taken of natural elevations and depressions in the ground. Sometimes the site may possess a stream, cascade, or natural inlet of water. Supposing no such facilities exist, the aspect and prospect which the plot possesses will be carefully studied and the best positions for hill and dale, lake and waterfall, determined. It often happens that water cannot be obtained, and if the character of the scene to be represented requires it, it is not unusual to arrange the hills, rocks and plants in such a way that the idea of water may be suggested. Sometimes a stretch of bare beaten earth or of well-raked sand will indicate a lake or sea, and a meandering pebbly bed a river, the surrounding rocks, plants and piles further assisting the delusion. Though the distribution of the several contours and features of a

Contours of a garden demand first attention.

Idea of water in a garden fictitiously conveyed.

garden is not confined to any invariable rules, there are several general principles which guide the designer in his arrangements. The garden, it must be remembered, is more than an artistic distribution of trees, flowers, shrubs and stones. It is, in Japan, a real picture composition, intended to represent some imaginary landscape.

Hill garden

In the Tsuki yama Niwa or Sansui Niwa (garden of artificial hills), in which hills form the most prominent features, these eminences are intended to represent actual mountains, and their distribution, form and character are arranged with the idea of connected mountain scenery. The distant peak, the broad sweeping contour of the nearer mountain, and the low rounded hills of immediate foreground are all meant to be expressed. The respective sizes of the trees and shrubs, and the scale and character of rocks employed as accessories are, in the best gardening, considered with a view to helping the effect of such an imaginary picture. The principle of suggesting to the imagination the idea of space by means of blanks and obliterations, so common in Japanese pictorial art, is followed also in such horticultural compositions. A hill, it is said, should never be constructed touching an outer fence or boundary; a space behind it, however small, will produce an idea of greater extension of the garden. By a similar theory, the spaces immediately behind the nearer hills should be left open and not filled with detail. There are five principal hills specified for gardens of the Tsukiyama type, in the *shin* or finished style. Hill No. 1 forms the most central feature of the nearer distance, and should be placed after due consideration of the other parts of the landscape, such as cascade, lake, stream and other hills. As it represents a near mountain of considerable size, it should have broad sweeping sides,

Mountain scenery suggested.

Use of blank spaces.

Five principal hills in the Shin style.

Hills represent the different mountains of a landscape.

and may have a pathway and a little house or pavilion upon it. Hill No. 2 should be placed adjacently to No. 1, a cascade and rocks often dividing the space between the two. It is secondary to No. 1 and should be somewhat smaller and of different character. Hill No. 3 is placed upon the other side of No. 1, near to the base of its broad slope, and more in the foreground; it suggests the idea of a lower hill divided from the main mountain by a depression. This depression may be supposed to be occupied by a hamlet, road or stream, in which case its sides should be clothed with a few thick foliaged trees or shrubs to add to the impression of a sheltered and inhabited dale. No. 4 is a small hill generally introduced into the near foreground; it should have none of the characteristics of a large mountain, should be low, rounded and covered with much detail in the form of stones, shrubs and flowers. Hill No. 5 is in the remotest part of the garden, and as it represents a distant mountain it should be steep and mysterious, without much detail.

Covering of garden hills.

The use of turf in Japanese gardens is of comparatively recent introduction. The level portions were formerly finished in beaten earth kept carefully weeded, or spread with white sand or broken shells. The hills were partly covered with different kinds of green moss. The mosses used were numerous, but the principal kinds were Mamezuta (Drymoglossum carnosum) and Himebitai (?).

Of late years turf has become much employed, and it is now usual to find the garden hills covered with it.

Hill garden "Gio" style.

The Sansui of the Gio or intermediate style preserves the same idea of mountain scenery as in the finished style, and a somewhat similar composition is employed, though the individual features are simplified and the appended detail of rock and trees is abbreviated.

Hill garden "Sō" style.

In the Sō or rough style some of these features are omitted.

Waterfalls.

No Sansui garden is considered perfect without its waterfall, real or suggested, and the cascade occupies the most prominent point in the background. The idea of sex is often applied to a waterfall, and in connection with the main torrent, called the *On daki*, there should be a minor fall separated by some distance and called the *Me daki*, or female waterfall.

Position of the waterfall.

The position of the cascade is generally between Hills No. 1 and No. 2. When water cannot be obtained, the existence of a cascade is often suggested by the construction of a rocky outlet backed with hills and overhung with growth, and a pebbly bed strewn with boulders will be arranged below. Just as with the hills so with the waterfall, the gardener takes as his model some natural landscape. There is no lack of fine falls in Japan, but it is a favourite fancy to depict a famous cascade in the province of Chiang-so, South of China, called by the Japanese, Rozan. This fall is near to a high mountain called Riumon, and both the waterfall and mountain are much sung by poets. For this reason it is often customary to introduce into a garden a high hill opposite to the cascade. In temple grounds the priests delight to associate such scenery with a famous landscape at the foot of the Himalayas, renowned in Buddhist lore for its cataract, lake, and four rivers issuing from the lake. In accordance with the fancy of portraying in a garden natural scenery of a grand scale, rules exist as to the veiling of portions of the fall so as to suggest greater height. A tree should be placed so that its branches hide the outlet of the cascade, which should also be surrounded by thick foliage to impart to it a solitary and profound appearance.

Models for garden falls.

Lake scenery and the model followed.

In water landscape, whether the water be real or suggested, the following methods exist. The beau-ideal of designers is a famous large lake in the province of Che Chiang in China, called by the Japanese *Seiko* and famous for its lotuses. To help the imagination to appreciate this conception, a garden lake, when constructed in a limited area, should never be completely visible from any one point of view, but parts of the outline should be intercepted and hidden by shrubs and plants placed in suitable positions. We find here again this important principle of suggesting limitless space by the partial obliteration of bounding lines.

Island scenery.

Four important islands are introduced into water scenery. The first is called *Horai-shima* or the

The Elysian Isle.

Elysian Isle, in allusion to the Elysian Isle of Chinese classics, supposed to be one of three islands existing opposite to the coast of China in the Eastern sea, and being "the dwelling place of genii whose lustrous forms were nourished upon the gems abounding upon its shores and from a stream of life forever flowing on its banks." The poetical figure is maintained in so much that the idea of its being an island in the sea must not be lost. No bridge should therefore connect it with the mainland. Its beach should have sand, pebbles and shells, and the use of fresh water plants in connection with it should be avoided. A fancy has arisen in connection with the tortoise as an emblem of longevity, of making this island somewhat in the form of a tortoise and adorning it with rocks and stones representing the head and members of this animal. This island is placed nearly centrally in a garden lake.

The idea of an island in the sea must not be lost.

The Wind-swept Isle.

The second island goes by the name of *Fukiage-shima* or the Wind-swept Isle, and is also used to represent a sea island. It should therefore never be placed

in a running stream (though it may be placed in a ake which by a stretch of imagination may be supposed to represent the sea). It should not have moss or any other characteristics of a lake or river island upon it. Its beach should be spread with shells, sand and shingle.

Master's Isle and Guests' Isle.

The two remaining islands, called respectively *Shujintō* and *Kyakuzintō*, are lake islands, and are introduced almost invariably into garden scenery when water is employed. The Shujintō or Master's Isle is so called because it is specially dedicated to the proprietor of the garden. It is placed in the foreground of the landscape, easily reached from the bank by a bridge, or a picturesque combination of bridge and boulders. The various stones with which this island is adorned have names implying functions of ease and recreation. The Kyakuzintō or Guests' Isle receives its name in honour of visitors to the garden. It is placed more in the background of the scene, is approached by bridges, boulders and stepping stones, and is adorned with rocks specially suited to the polite functions of hospitality.

Importance of stones in Japanese gardens.

One of the most striking differences between the native and foreign systems of landscape gardening is the great importance given in the former to the use of natural unhewn stones and boulders of various form. In a few of the most remarkable European gardens, such as the Buttes Chaumont, Paris, we have rock scenery of considerable grandeur introduced, and it is very common to arrange rockeries and even grottoes in comparatively small gardens. With rare exceptions, however, such designs consist of formless blocks of slag and broken rock massed together with the assistance of earth, the hollows forming the receptacles for ferns and creeping plants. The form of individual pieces is not considered, and the shape

of the constructed mass is left almost to hazard. According to Japanese professors, proper judgment in the selection and arrangement of stones is one of the first principles of gardening. The sizes and proportions of the different stones employed governs, in many cases, the scale of the trees and shrubs used in juxtaposition. Some writers go so far as to say that stones constitute the skeleton of the garden, that their form and distribution should receive the first attention, and that the trees and shrubs should be placed afterwards in such a way as to emphasise and "*support*" these stones and connect them into one harmonious composition. It is important to preserve an appropriate scale in their employment, and for this reason it is necessary to avoid using very large stones in a small garden, or small stones in a large one. The principal boulders of an artifical landscape being arranged to represent natural rocks, it is often customary to describe their altitude by fictitious measurements applicable to the grandeur of real scenery. This custom not only helps to keep up the imaginary illusion, but no doubt assists the designer in a consistent preservation of the character of all subsidiary parts. Another favourite conceit is to apply to stones the idea of the male and female elements supposed to exist in all natural creations. Probably an explanation of this poetical fancy is to be sought in the creed or legendary cult of the early Japanese, in which, as recorded in the Ko-ji-ki, all nature is produced by the union of the male and female elements.

Scale to be kept in employing stones.

Fictitious dimensions given to stones in a garden.

Sex in stones.

In accordance with such an idea, rocks and stones are often arranged in pairs,—not pairs of resemblance, but pairs rather of contrast. Nor is such a fancy merely capricious; it is well worthy of note as indicating an important æsthetic principle, namely,

that of antithesis in composition, and also the principle of supporting prominent masses by lower forms. Some stones, in which the nature of the two sexes is said to be united, are used singly. There are many important rocks, such as those used on the banks of lakes or streams, as well as all auxiliary stones used in giving finish and connection to the landscape, to which the idea of any sexual character is not applied.

Necessity to avoid copying the wilder of nature's freaks in a garden.

The chief thing to be kept in mind in arranging garden stones is to make them appear as if nature had placed them in position. Some of the wilder freaks of nature in her lithic structures must however not be copied, for, if artificially imitated on a comparatively small scale they would be suggestive of instability and danger, and destructive to the general repose required in an artistic composition. It is the immensity, antiquity and adamantine solidity of the overhanging rocks and towering pinnacles of natural landscape which reconciles us to their threatening appearance.

A general rule exists that no stone should be used in gardening which is larger at the top than at the base. This rule is apparently often violated, but such exceptions are generally to be accounted for by some extenuating circumstances. The primary reason for such a rule, namely the desire to secure an impression of stability and repose, no longer exists if the rock or boulder be flanked by a cliff or hill, or if its overhanging portion be supported by a companion stone. Other errors to be avoided are pointed out, such as the erection of a vertical slab-shaped stone, having its principal axis rectangularly directed towards the building (literally—so as to cut the building) unless it be behind some distant hill or in a valley, below the level of the foreground. Certain maxims with regard

to arrangements adopted are founded upon what custom has sanctioned as auspicious or condemned as ominous.

Ominous and propitious shapes.

There are sacred spots in a garden, such as the Guest's Island and the Proprietor's Island, where particular care is necessary to avoid the introduction of stones suggestive of ominous forms or association. Other stones of a propitious character consecrate the garden, and without them it is not considered complete.

Nomenclature of garden stones.

The nomenclature applied to garden-stones is extremely complicated. Some names indicate merely the geological character of the stone and the locality which produces it. Such terms are *Mikage-ishi*—a kind of granite from the village of Mikage in Yamashiro, and *Sado-ishi*—a kind of jasper rock of a deep red colour and abundant in the Island of Sado. *Mikage-ishi*, and other kinds of granite, white, grey and reddish in colour, coming from Ōsaka, Hōki, Sanshiu and Bingo are used for wrought stone slabs and steps, for *tōro* (lanterns) and for *chozubachi* (water basins).

Locality of production.

Geological character.

The irregular shaped rocks employed for the other parts of the garden are either limestones which have been subject to the action of water, or scoriatious lava shaped by igneous action. The blue and white limestone rocks come principally from Chichibu mountain in Bushu, Yoshino river in Kishiu, and one of a yellowish tinge comes from Iyo. Some of these stones have white veins, a favourite kind being that in which the veins somewhat resemble the grain of wood. Large slabs of stone are sometimes used vertically in gardens, being placed on their edge. These are slates or schists; and they are either of a dark grey or sometimes of a reddish colour. Nebukawa village in Sōshiu is the source of much of this kind of stone. A favourite kind of rock containing numerous

holes and cavities is found both on the sea-shore and on mountains; the two kinds are slightly different in character. The sea-rock comes from Odawara in Sōshiu and the mountain-rock from Kawanu in Idzu. Care must be taken to use water rocks only in connection with water-landscape, using the mountain rocks on the hills. Round reddish stones are brought from the Kamogawa, Kyōto, and the Tenringawa in Enshiu. There is a rare kind of stone called Shokuaseki coming from India, which is very valuable; it is said to be petrified pine and is used on hills.

Names indicating position of stones.

Other terms refer to the position which the stones hold in a garden, such as "*Mountain summit stone*," or *Wayside stone*. The particular function of individual stones often accounts for the name, such as the *Angling stone*, or the *Torrent-breaking stone*. In the gardens of religious buildings, rocks and stones invariably receive the names of saints or deities, according to the order of the arrangement and the particular conception of the designer. Even in ordinary gardens there are generally a few stones possessing the names of certain Buddhist divinities, the use of which is considered propitious. A large number of the names used refer to the form of the stone or to some imaginary resemblance which such form suggests; many of the names of this character are not general but merely local, having been invented at the caprice of famous men and applied to the features of ancient gardens. They are therefore seldom used by modern gardeners, and may be regarded as purely historical appellations. The following is an enumeration of the different stones referred to in works upon the subject, arranged according to the position in which they are generally to be found.

Stones named after Buddhist deities.

Hill Stones.

Stones used on various parts of garden hills.

Sancho-seki.—Mountain-summit stone.

Reikyaku-seki.—Mountain-base stone.

Sanshō-seki.—Mountain-side stone.

Hyō-in-seki—Mountain-path stone.

Keiun-seki.—Propitious-cloud stone.

Mu-in-seki.—Mist-enveloped stone.

Sei-getsu-seki.—Clear-moon stone.

Getsu-in-seki.—Moon-shade stone.

Teito-seki.—
Taido-seki.— } Cave stone.

Kannon-seki.—Stone of Kannon (Buddhist deity).

Stones Adorning a Lake or Stream.

Stones used to adorn water scenery in a garden.

Eno-seki.—This name is given to a pair of stones used upon a beach and suggesting the forms of the male and female mandarin duck (*anas galericulata*). These water-fowl when paired shew great attachment, and in Chinese classics are taken as emblems of conjugal fidelity and affection (see Mayers). These stones are often used upon the beach of an island.

Sui-jyo-seki.—Water-diverting stone. This stone is placed at the mouth of a stream to divert the current and add interest and variety to the stream.

Sui-cho-seki.—Angling stone. This forms a suitable prominence for fishing from.

Sui-mon-seki.—Water-gate stone. This is placed at the mouth of a stream or the outlet of a lake.

Raku-sui-seki.—Falling-water stone. This stone is used at the base of a cascade to receive the torrent and break it into spray.

Rō-shu-seki.—Wave-receiving stone. Is placed in the current of a stream to give it variety.

Ō-shuku-seki.—Water-fowl-dwelling stone.

Sui-cho-gan.—Water-fowl stone.

Do-tō-seki.—Wild-wave stone. This is placed at the extreme edge of the water of a lake.

Suibon-seki.—Water-tray stone. This name is given to a flat stone placed in a lake so that its upper surface is just above the water level on ordinary occasions, but may be slightly covered when the water rises. It should be within an easy step from the bank.

Jū-gyō-seki.—This name is given to a pair of stones placed on the edge of a stream or lake and hollowed out below, so that the water may ripple beneath them.

Stones of a Cascade.

Stones used in connection with the cascades of a garden.

Fudō-seki.—Stone of Fudō. Fudō is a Buddhist deity represented as holding a sword and surrounded with flames. Cascades are specially dedicated to him, and at the outlets of some natural torrents, such as the *Urami* waterfall at Nikkō, his form is sculptured on the overhanging cliff. In garden waterfalls there is always one vertical stone which is supposed to represent this god.

Dō-shi-seki.—Childrens' stones. This name is applied to eight smaller stones surrounding the Fudōseki and supposed to represent children attendant upon Fudō.

Nami-wake-ishi.—Wave-dividing stone. This is used in the torrent at the base of a cascade.

Mizu-wake-ishi.—Water-dividing stone.
Mizu-uke-ishi.—Water-receiving stone.
} These are similar to the above and of similar use.

Shugo-seki.—This stone has several other names, one being the Immovable stone. It often forms the rocky cliff over which a waterfall pours and is generally paired with another stone.

Taki-tsubo-ishi.—Waterfall-vase stone. Placed to receive the fall of water.

Stones of the Elysian Isle (Horai Shima).

Stones used upon various islands in a garden.

Elysian Isle.

The conception of this island has been already explained. Being made to represent the form of a tortoise, the stones which adorn it have reference to the members of this animal.

Kitō-seki.—Tortoise-head stone.

Ryō-shu-seki.—Fore-legs stone.

Ryō-kyaku-seki.—Hind-legs stone.

O-saki-seki.—Tail stone.

These stones are all placed with great care, and a pine tree is planted in the centre of the island, growing as it were out of the back of the tortoise. Sometimes this pine tree is replaced by a stone in the form of a smaller tortoise.

Stones on the Master's Isle (Shujin-tō).

Master's Isle.

Ankyo-seki.—Stone of easy rest.

Yukyo-seki.—Stone of amusement.

Yōsoku-seki.—Stone for resting the loins upon (sitting stone). The above names refer to the recreation of the proprietor and the functions which the stones fulfil to that end.

Stones on the Guests' Isle (Kyakuzin-tō).

Guests' Isle.

Shaku-hai-seki.—Guests-honouring stone.

Taimen-seki.—Interviewing stone, or stone of obeisance.

Ridatsu-seki.— } Shoes-removing stone.
Kutsu-nuki-ishi.— }

The above names refer to the functions of hospitality. In addition to these, the following are often placed on the Guest's Isle.

Ōshuku-seki.—Water-fowl-dwelling stone.

Suichō-seki.—Water-fowl stone.

Stones of honor.

Another important stone used sometimes on either the Master's or the Guests' island is the *Jō-za-seki* or

Yazen-seki, meaning Best-seat-stone and intended as the seat of honour for the proprietor or his principal guest. It is said to represent a famous large rock near to a sacred tree in India, and for this reason should have a fine old tree planted near to it. The same stone is sometimes called *Shyo-gaku-seki* or *San-kai-doku-san-seki*.

Other stones often used upon islands are the

Fude-ishi, Pencil stone, referring to the hair pencil used for writing with.

Renyō-seki or *Kenteki-seki*, Ink stone, referring to the stone used for preparing the Japanese writing ink. This is always placed in conjunction with the *Fude-ishi*.

Hikka-seki.—Brush-rest stone.

Stones in Connection with a Water Basin.

Stones used in connection with a garden water vase or basin.

Kagami-ishi.—Mirror stone. This should be a bluish stone and polished to give reflection.

Ishi-dai-ishi.—This name is given to the rough stone supporting the hewn stone basin.

Shozō-ishi.—Standing stone. This stone is stood upon while using the water in a basin.

Mizu-kumi-ishi.—Water-filling stone. Upon this stone the servant stands to pour water and assist.

Mizu-age-ishi.—Water-raising stone. This stone is higher than the others and is used for filling the water basin from.

Sui-komi-ishi.—Water-drain stones. The name given to several round stones placed to cover the drain outlet.

Stones in Connection with the Tea Ceremonies.

Stones peculiar to the tea ceremonies.

Yutō seki.—Kettle stone. This stone, as its name implies, is used for placing the hot water utensil upon, for tea making.

Teshoku-ishi.—Candle-stick stone. Upon this the hand-lamp or candlestick is placed.

Maye-ishi.—Front stone. A stone placed in front of the above.

Tsukubai-chozubachi-ishi.—The name of this stone implies that it is a low hewn stone basin or hollowed stone which is used in a crouching attitude.

Katana-kake-iski.—Sword-hanging stone. This stone is a double stepped stone mounted in hanging the sword upon a sword rest which is attached to the wall.

Names of stones peculiar to a particular garden.

The following names of stones are taken from the description of the famous garden of Daisen-in in the temple of Daitoku-ji designed by Sōami. The names cannot be all considered as general names, being probably in most cases specially applied to the rocks of this particular garden as suggested by their shapes.

Gagyū-seki.—Lying-ox stone.

Kiko-seki.—Tortoise-shell stone.

Chō-sen-seki.—Long-ship stone.

Kotō-seki.—Tiger's-head stone.

Semlō-seki.—Genius's-hat stone. Probably so named after the hat of a *sennin* or genius supposed to dwell in the wilds.

Meikio-seki.—Clear-mirror stone.

Daruma-seki.—Daruma stone. So named after the first patriarch of the Chinese Buddhist church, represented as a hooded crouching ascetic. It is popularly asserted that he sat in religious contemplation until his legs rotted off, and he is therefore often represented in toys and snow images as having no legs.

Fudō-seki.—Fudō stone. (See previous explanation.)

Kannon-seki.—Stone of Kannon. (See also previous explanation.)

Amba-seki.—Saddle-shaped stone.

Butsu-ban-seki.—Buddhist-paten stone.

Chiukō-seki.—Faint-smell stone.

In connection with monastery gardens, stones are used to represent different Buddhist deities or saints, such as Ragora the son of Sakya Muni or, Anan, one of the famous Rakan (Arhat).

Stones named after Buddhist deities.

To enumerate these would take us too far beyond the immediate subject of gardening.

Stones used in Plains, Valleys and Roads.

Stones used in plains, valleys, and roads, and common to most gardens.

Ni-jin-seki.—Stones of the two gods.
Ni-ō-seki.—Stones of the two kings.
These are two similar stones placed near to the entrance of a garden and intended to represent the guardians of the site, just as two statues of Buddhist kings or devâhs are placed at the entrance of temples.

San-jin-seki.—Stones of the three deities. Sometimes used in place of the above.

Reihai-seki, or *Hai-seki.*—Stone of worship. This stone is always placed near to a sacred stone such as the above. It is broad and flat in form and is intended for prostration upon.

Hikai-seki.—This name is given to a boulder, generally somewhat conical in shape, which is placed in some prominent part of the garden near to the central hall of the residence.

Shōzō-seki.—View-receiving (lit. taking) stone. The meaning of this term is not clear, but it appears to signify that this stone marks the point from which a fine view of the garden can be taken.

Taijō-seki, or *Taitō-seki.*—View-completing stone. The name probably refers to its paramount importance as a garden feature.

Aishirai-ishi, or *Jiyai-seki.*—Setting-off stone. The meaning is probably similar to the above.

Mikoshi-iwa.—Distancing-rock. This name is gen-

erally used in connection with a rock or stone behind a hill or in some part of the background intended to give an idea of greater distance.

Nozoki-ishi.—Peeping or peering-stone. This name implies probably that such a stone is partly hidden from view.

Santai-seki.—Stone of three forms.

Sakazuki-ishi.—Wine-cup stone, so named from its resemblance in shape to a wine cup.

Dōkyo-seki.—Way-side stone.

Kōro-seki.—Passing-on stone. This stone appears to be placed at the side of a walk like a mile-stone or some stone unsuitable for resting upon, the name contrasting with that of the former, *Dōkyō-seki*, intended as a resting stone.

Five prevailing shapes of stones used in various grouped combinations.

The following five stones are given as examples of the principal shapes sought for in arranging stones into groups. The names have reference to the peculiar forms, and combinations of portions of these names indicate the different methods of grouping.

Taitō-seki.—A tall vertical stone broadening towards the middle, and slightly conical at the top.

Reijo-seki.—A lower conical rounded stone somewhat resembling the bud of a magnolia flower.

Shintai-seki.—An irregular low stone, flat at the top, higher, however, than the ordinary stepping stone.

Shigyo-seki.—A stone of medium height arched in a hollow on one side and with a flat table-like top.

Kikyaku-seki.—A long, bent and rounded boulder, higher at one end than at the other, and resembling somewhat the torso of a sleeping animal.

Double combinations from the five varieties of form.

Double group combinations of the above:—

Rei-sho-gumi-kata.—Grouping of *Reijō-seki* with *Shintai-seki*.

Rei-eki-gumi-kata.—Grouping of *Reijō-seki* with *Shigyo-seki*.

Shin-shin-gumi-kata.—Grouping of *Shintai-seki* with *Kikyaku-seki.*

Fūtai-seki-gumi-kata.—Grouping of *Taitō-seki* with *Shigyoku-seki.*

Reikyaku-seki-gumi-kata.—Grouping of *Taitō-seki* with *Kikyaku-seki.*

Shi-kyaku-seki kumi kata.—Grouping of *Shigyō-seki* with *Kikyaku-seki.*

Nisō-seki kumi kata.—Grouping of *Reijō-seki* with *Taitō-seki*, often used near a clump of trees.

Shintai-seki kumi kata.—Grouping of *Reijō-seki* with *Kikyaku-seki.*

Shorei-seki kumi kata.—Grouping of *Taitō-seki* with *Shintai-seki*, often used on the edge of a lake or stream.

Fūtai-seki kumi kata.—Though phonetically the same, the character for *tai* has a different meaning than in the previous *Fūtai.* Grouping of *Tai-jō-seki* with *Shintai-seki*, used for setting off trees.

Triple group combinations of the same:—

Triple combinations made from the five varieties of form.

Reishin-kyaku kumi kata.—Grouping of *Reijō-seki*, *Kikyaku-seki* and *Shintai-seki.*

Reijō-kyaku kumi kata.—Grouping of *Reijō-seki.*

Shigyo-seki and *Kiyaku-seki* so as to form an imaginary landscape.

Reido-kyaku kumi kata.—Grouping of *Taitō-seki*, *Reijo-seki*, and *Kikyaku-seki*, often used at the mouth of a waterfall on the slope of a mountain.

Rei-shi shin kumi kata.—Grouping of *Reijo-seki*, *Shigya-seki*, and *Shintai-seki*, used at the bottom of a fall of water. It should not be used on a hill.

Reishin-do kumi kata.—Grouping of *Taitō-seki*, *Reijo-seki*, and *Shintai-seki.* This group is used for the *Getsuin-seki*, and is always placed in an umbrous distant spot.

Reishi-dō-kumi-kata.—Grouping of *Taitō-seki*, *Reijo-*

seki and *Shigyoku-seki*. This group is often used at the mouth of a waterfall, when it is called *Takizoe-gumi* (waterfall screening combination). It is also sometimes used at the side of a hill or island pathway.

Shinshitai-no-hō.—Grouping of *Taitō-seki*, *Shigyo-seki* and *Shintai-seki*, the two former being connected. Such a combination is used often at the foot of hill or on an island.

Shintaikyaku-gumi-kata.—Grouping of *Taitō-seki*, *Rikyaku-seki* and *Shintai-seki*, used near to a garden entrance. This combination sometimes replaces the *Ni-ō-seki* and receives its name.

The whole five varieties sometimes used in combination.

Sometimes the above five stones are used in one group in combination with trees and plants, and there are three different arrangements corresponding to the formal, intermediary, and free styles formerly explained.

Level parts of a Japanese garden.

Use of sand, gravel and earth.

It has been already mentioned that turf is not used to any large extent in Japanese gardens. The plain open portions are spread with gravel or sand, or, what is very common, a firm beaten surface of well-swept and well-weeded earth is preserved. As this is kept slightly damp it presents a very cool and pleasant surface. For the preservation of such earthy or sanded areas, and also as a comfort to the pedestrian in wet weather, a pathway is often constructed of raised stepping stones called *tobi ishi* or *sutai ishi*. In the gardens attached to tea-rooms these stepping stones constitute one of the most important features of the garden; and in all gardens without exception they are used to some extent. In such arrangements we find for the first time the use, in some places, of hewn and squared stones. Nothing could be more distasteful than a formal row of stones used as steps in this way. Every one has remarked the difficulty

Pathway of stepping stones.

of keeping balance in walking upon stones placed exactly in a row: it is like walking upon a very narrow bridge; and in addition to this, such regularity would be highly inartistic. We are then not surprised to find carefully considered rules as to the disposition of such stones in a garden. The Japanese have several stones and groups of stones more prominently important than the rest which have special shapes and sizes specified for them, but even the ordinary intermediate stepping stones are carefully arranged with a studied irregularity and convenience. The system of arrangement differs: sometimes in fours and threes, sometimes in threes and twos, then broken by hewn *Tanzaku-ishi*, or other narrow hewn stones. The laying of such stones should commence from the building, and here is generally placed a stone broader and higher than the rest, serving as an easy step from the verandah. This stone is sometimes called the *Kutsu nuki-ishi* (stone on which boots are taken off). Between this and the verandah there should be space sufficient to place a pair of sandles or clogs hidden from view. From this point irregular flat stones are placed in a zigzag formation and generally in a curved line. Convenience in stepping is carefully considered, but at the same time the stones being different in size and shape the intervals are very irregular. Sometimes a line of such stones will branch off in two directions, and at the point of junction a large stone is placed, which is called either the *Fumi-wake-ishi* (Step-dividing-stone) or the *Karan-seki* (Snail-stone), from a supposed resemblance to a snail. *Garanseki*, spelt with different characters, means a pedestal for a Buddhist statue, and this name is sometimes used because Sōami, an ancient connoisseur, is said to have used such a pedestal for this purpose.

Art of arranging such stepping stones, for convenience in walking and for variety of effect.

In some places, such as in front of a verandah or

Use of hewn strips of stone.

a flower bed, a long rectangular strip of hewn stone is used or a combination of pieces of hewn stones of irregular sizes arranged in a long oblong strip. Such an alternating arrangement of square stones is called the *chōbankaku*, or long and short pattern. Such stones have wide joints filled in with a kind of mortar and earth. Sometimes these oblong strips are formed of a number of irregular slabs of stone, with intermediate spaces filled in with large pebbles laid in mortar. Sometimes two long strips of hewn stone called *Tanzaku-ishi*, from the resemblance to the *Tanzaku* or cards employed for writing verses upon, are used together, placed side by side, so that the ends overlap about two-fifths of their length.

Large slabs of hewn stones are also used separately as steps to a verandah, and in some cases one of the posts of the verandah rests on the edge of such stone or is dowelled into it. Other narrow strips of stone sometimes employed go by the name of *Obi-ishi*, meaning litterally *girdle stone*, named after the long, narrow belts used round the loins.

Manner of grouping stones around lanterns.

Groups of stones around lanterns and water basins are disposed in a similar way to the combinations explained, the lantern or stone basin being regarded as taking the position of the principal stone of the group.

Sand used as an ornamental feature.

A favourite way of ornamenting flat gardens is to spread such portions with sand, which is kept carefully raked. The raking is sometimes made in patterns. A common treatment is to rake the loose sand in lines, conventionally representing water. Gardens consisting of such areas of raked sand, with a few stones representing rocks and islands, are not uncommon.

Use of trees and shrubs in connection with stones.

Garden stones can only properly fulfil their office by the suitable arrangement of trees, shrubs and grasses in connection with them. In some cases these are planted so as to branch over and partly

hide the stones which they adorn, in other cases they form a background of thick foliage behind them. As a rule such planting is determined after the principal stones have been placed in position. The gardeners appear studiously to avoid regularity in the arrangement of shrubs and trees. In connection with the temples there are many magnificent avenues and groves of fine trees arranged with the same formality as is employed in Europe. Some of the avenues of cryptomeria and of *Enoki* (Celtis cinensis) lining the country roads and temple approaches are hardly equalled in grandeur by any avenues in the west. But in landscape gardening such arrangements are seldom if ever resorted to. In cases where trees are grouped together in numbers they are generally of different species and specially selected to contrast with one another. Form and line receive primary attention, as in the case of flower arrangements. Such contrasts as that which the rugged pine (*matsu*), with its scrambling angular branches, forms with the spreading cherry, or the drooping willow, with its curving boughs, are purposely designed. An established rule is that when several trees are planted together they should never be placed in rows but in open files, so that the majority of the group may be seen from many different points of view. Trees and plants should not be used in positions contrary to their natural habits of growth; for example, a hillside plant should not be placed in a valley nor should plants peculiar to low sheltered spots be placed on high ground. As a general rule trees which shed their leaves and look bare during the winter should not be planted in the foreground of a garden; an exception to this rule, however, is in the case of the plum tree, which on account of its early blossoms is placed in the front of the grounds. Reference has

Avenues of trees.

Trees of contrasting forms juxtaposed.

Natural habits of growth considered.

been made to the artificial practice at one time much in vogue in European gardening of shearing trees into curious unnatural shapes. The habit of clipping and shearing trees and shrubs is a common one in Japan, but it is seldom done in a manner inconsistent with the general character of the particular trees thus dressed. The Japanese have a remarkable power, noticeable also in Europe during the middle ages, of seizing upon the characteristic and fundamental forms of natural objects. Just as in their writing they have made a sort of shorthand representation of Chinese characters in the *kana*, so they have in their arts, as applied to the uses of every-day life, created a sort of shorthand or contracted representation of many natural forms. A characteristic example is the native pine (*matsu*) which, with its apparent rugged irregularity, will be found to group its foliage into clumps of a flat foliated form slightly arched below. This prevailing outline of trefoil or cinquefoil shape is copied in a conventional representation often to be seen upon industrial objects. Generally in the formal trimming of trees the gardener in a similar way aims at an exaggerated display of some such characteristic forms, and seldom produces shapes entirely at variance with nature. The garden pine goes through a thorough surgical treatment in the nursery, with the idea of producing a shape of acknowledged beauty as displayed in some of the finest natural trees. Its branches are bent, broken, bandaged and bound with cords and splints until it grows into the fancy shape required. Other dwarf trees are sometimes trained into curious bent and spiral forms.

Clipping and shearing of trees.

Methods of training the *matsu* or pine.

Forced training of trees.

The *matsu* or pine is the favourite garden tree, and severals methods of arranging its branches are adopted. The style called *tama tsukuri* or ball-shaped treatment consists in cutting the branches into the form of a

number of discs or balls. Another favourite method is called the *Fuse tsukuri*, which consists in training the different branches upon numerous horizontal strips of bamboo so that the foliage arranges itself in lines and ridges. There is still another style of treatment called the Kōrin style, so named after a famous painter named Kōrin. This style consists in training the branches in a pendent arched manner supposed to represent the lines of a cascade.

Rounding of shrubs and grouping in masses to represent hills.

With regard to the training of low shrubs, they are generally cut into hemispherical forms, so that they represent rounded masses of variegated greens placed upon the hill-sides and between the rockeries. Various kinds of juniper and the *Chabo hiba* (dwarf Thuya obtusa) are treated in this manner. Such spherical masses are frequently arranged in groups towering one behind the other so as to suggest the forms of green hills. This art was carried to perfection in some of the ancient gardens.

In the Abbot's garden at Henjoshiu In, Hachijo, Kyōto, designed by the priest Musokokushi, the trees are thus piled in spherical clumps intended to suggest a picture of the scenery of Rozan in China, before referred to as remarkable for its mountain and torrent.

This garden being waterless, the idea of the scene depicted has been further expressed by trees with weeping branches to suggest the waterfall, and by means of white sand spread below like running water.

The composition is perhaps a strained one, relying implicitly upon the powers of imagination possessed by the observer; but it is interesting as showing the immense importance given to form and line in Japanese horticultural designs. The most purely artificial arrangement applied to trees is to be seen in the boat-shaped forms into which bushes are occasionally cut so as to resemble a ship or junk in full sail.

Rules as to trees in certain position.

The following rules exist with regard to trees in certain positions. Large trees should never be placed on a hill unless very near to its base; they are best planted behind it, so that their branches partly overhang it.

Trees near lakes or streams.

Trees planted near lakes or streams should be so placed that the sun shadows may be cast on the surface of the water. Similarly those planted near to a well should be arranged to cast a shadow on the surface of the water and keep it from the rays of the sun. The Pine, Plum, and Willow are all suitable trees for a well-side, but the roots of the willow are apt to push out the stones of a rubble-lined well.

Trees suitable for a water basin.

A water basin also should be shaded by a clump of bamboo or some tree or high shrub, taking care that the foliage reaches one foot or eighteen inches above the level of the water in the basin. Plants infested by noisome insects, which are apt to get into the basin, are to be avoided; the following plants are suitable for such a position, and great care is necessary in arranging them artistically: Nanten (Nandina domestica), Shoku (?), Misawaki (?), Aokiba (Aucuba japonica), Nishikige (Enonymus alatus), and Asebo (?).

Trees suitable for bridges, cascades, and for the surrounding of tea rooms.

A tree planted near to a bridge should be placed so that the branches project over the bridge and the shadow of the tree should fall on the surface of the water. A tree should be planted so that its branches come in front of the mouth of a cascade and produce a shady and gloomy view. Trees should be planted near to the verandah of a house or tea-room, at the highest point in a steep road, and in the middle of a steep path, so as to provide a shady place for resting in. The best trees for such positions are the *Matsu* (Pine), the *Kurinoki* (Chestnut), *Kiri no ki* (Paullownia imperialis), and the *Kaki no ki* (Persimmon). Certain superstitions

Ominous plants.

exist forbiding the use of particular plants, such as the *Omoto* (Rhodea japonica) and the *Shichiku*. The *Shichiku* is a kind of spotted bamboo, and its parti-colored appearance is historically attributed to the tears of blood wept by the daughters of Yao, an ancient king of China, on the decease of their father. Fragile reeds and rushes easily broken by the wind should not be used in a garden.

The shrubs most used upon hill-sides and around the principal rocks of a garden are various kinds of Rhododendron, Azalias, and Junipers. For hedges *Chabohiba* (Thuya obtusa), *Mokkoku* (Ternstrœmia japonica) and *Mōchi* are preferred. There are many species of bamboo, of which the species called *Kumazasa* and *Chigozasa* (Bambusa senanensis and Bambusa variegata) are the best for the surrounding to a waterfall, and *Bugozasa* (bamboo from the province of Bungo) for planting in the flat part of a garden. In connection with fences, the shrubs most planted are *Hagi* (Lespedeza bicolor) and *Kuro-moji* (Lindera sericea). At a river side, *Kakitsubata* (Iris lævigata), Kohone (?) and *Ashi* (Phragmitis communis) are used. Among the principal large trees of a garden are the Pine, *Hinoki* (Thuya obtusa), *Chabohiba* (Thuya obtusa) *Shii* (?) *Kashiwa* (Quercus dentata), Maple, *Kaname* (Photinia glabra), *Maki* (Photocarpus macrophylla) and Camellia.

Names given according to position trees occupy.

Terms are often applied to the principal trees of a garden to indicate their relative functions and importance in the composition. The following may be taken as examples placed in the order of their importance.

No. 1. *Shōjin boku.*—The principal tree which should be placed in the most prominent position of the landscape. It should therefore be a fine large pine or oak tree of striking proportions and good shape. It may be surrounded by other trees which compare well

with it; in fact the term Shōjin boku is applied rather to the group, of which the central or principal tree should fulfil the above requirements.

No. 2. *Keiyō boku.*—The name implies "view perfecting tree" and it is only secondary to the Shōjin boku. It may be placed in some central part of a landscape. If in lake scenery, it may be on an island.

The form of its trunk and branches must be well studied with a view to harmony of line with adjacent objects, whether such features be a well, a cascade, or a water basin. This tree should contrast with No. 1, so that if the Shōjin-boku be a rugged pine tree the Keiyō boku should be a leafy tree of different character.

No. 3. *Sekizen boku.*—This means, "tree of solitude," and it should be placed so as to give cool shade and a solitary aspect to a portion of garden. It sometimes forms the principal feature of a continuous clump of trees planted in the background of the garden.

No. 4. *Taki-gakoye.*—This name is given to the tree or group of trees which forms a gloomy background to a cascade.

No. 5. *Seki yō boku.*—This term implies "tree of the setting sun." The Sekiyō boku is planted particularly with the idea of its appearance in the evening glow, and should be placed so that the setting sun may be seen through its branches. Some tree which reddens in the autumn is preferred, such as the maple.

The plum and cherry are often used. If an evergreen be used it should always have a maple or some red-leaved tree with it; in such case the name is applied to the group of trees.

No. 6. *Mikoshi-matsu.*—This means literally "distancing pine." The idea intended is that this tree should suggest distance, and it should be behind the further hills of the garden and may be rendered

indistinct in outline. In a small garden the Mikoshi-matsu may even be outside the fence. A pine or oak is generally used.

No. 7. *Nagashi-matsu.*—Sometimes called Enko-matsu. Both names refer to the long stretching arms of the bent pine tree. This tree should be placed over a lake or stream. It should lean out horizontally, and its long stretching branches may be supported upon props or upon piles erected in the water. A kind of juniper is sometimes used instead of the pine.

The above technical terms may be taken as referring to important features in the horticultural composition of a garden. Numerous other trees are used whose office is to strengthen and add interest to such features, and others are planted to connect the whole composition and blend it all into one harmonious whole.

Flowering trees.

The flowering trees and shrubs so abundant in Japan supply to the gardens an ever-changing variety of rich colour, and for the most part the landscape gardener depends upon them and certain trees of brilliant foliage for his colour effects. The plum, peach, cherry, camellia, wisteria, many-coloured azalia, rhododendron, and others, follow in regular succession from spring to autumn, and in the fall come the convolvuli, lespedeza, and other flowering shrubs and grasses. In public gardens or grounds which it is necessary to throw open to sight-seers, such flowering trees are often massed together in great numbers. Some gardens are noted for their groves of cherry trees or plum trees, and others for their banks of azalias. As a general rule, however, the horticulturists prefer to distribute the flowering trees in such a way that they shall come between the foliage of evergreens, in which position they are shown off to much greater advantage. In a *Sansui* garden flowering plants are

Groves of flowering trees.

little used; perhaps the only exceptions are the iris, which is planted on the edge of a stream, and the lotus, which is placed in the lakes.

Flower beds.

The *Hana batake* or flower bed, however, exists in another part of the grounds independent of the landscape garden, and is generally placed in a flat area opposite to the ladies' appartments. Such arrangements partake more of the nature of a flower show, flowers of the same kind being arranged together, with rarely any attempt to make geometrical combinations of colour.

Flowers most used in beds.

The flowers thus cultivated in separate beds are peonies, irises, dahlias, and chrysanthemums. The wisteria is also displayed upon trellises. Roses have been introduced of late years, but the attempts to cultivate them in Japanese gardens have not met with very great success. The culture of the chrysanthemum is by far the most successful, and the Japanese horticulturists have obtained endless varieties of shape and colour as well as marvellously prolific specimens, in some cases four or five hundred flowers being produced from one stem. Flower gardens do not however take the same position of importance in Japan as they do with us; they are considered an effeminate taste. One might visit many gardens in this country and come away with the impression that the Japanese did not go in for flower beds at all.

Lanterns.

Arrangement of lanterns in a garden.

Stone lanterns form an important feature of Japanese gardens. It is recorded that the first stone lantern erected in Japan was built by order of Prince Iruhiko, on the edge of a road-side lake at the village of Tanihiko in Kawachi, as a protection against robbers which infested the spot. Whether this popular story be true or not, it is anyhow certain that the

stone lantern is of Japanese invention. In China, whence the Japanese drew for their early ideas of gardening, such ornaments do not exist. In modern times standard lanterns of porcelain have been made and are to be seen in some gardens, but whatever may be their value as specimens of keramic skill, their appearance ill accords with the landscape. Bronze lanterns abound in connection with the temples, and antique examples of this kind are sometimes introduced into gardens as *objets d'art*, just as bronze Buddhas and saints are often employed. The ordinary material however is granite or syenite, of which stone many kinds exist in Japan. These stone lanterns or *tōro* are placed in various parts of the garden. The usual positions are at the base of a hill, upon an island, near a well, and at the side of a water basin. The size and proportion of lanterns is of great importance, and must be carefully considered according to the general character of the garden. The following rules are laid down as to the proper use of such ornaments. A lantern should be placed near to a garden lake in such a way that the light may be reflected in water. If a lantern square in plan be used, it should be placed diagonally with reference to an adjacent building, for the reason that all parallel and rectangular lines are to be avoided. A garden lantern should be what is technically called *supported* by trees, shrubs, and stones placed around it; a shelter should also be placed near to it in the form of a leafy tree so as to partly dim the light and impart a mysterious, solemn effect to the view. The idea of a lantern is not to illuminate the garden, but to produce a calm and serene appearance.

Material of which lanterns are constructed.

General rules as to disposal of lanterns.

Stone lanterns are chiefly valued for their age, and hence there exist various methods for imparting an aged appearance to those which cannot boast real

Stone lanterns valued for their age.

antiquity. Green moss or white lichen are purposely made to grow upon such lanterns. Patches of velvet moss are sometimes attached by means of a solution of rice and water. One trick is to stick over the lantern fallen leaves by means of bird-lime, and when these become decayed by the rain, dew, and frost, a white moss will appear below. Another trick is to smear with the slime of snails, which when kept in the shade and continually wetted is said to produce a white lichen upon the stone.

Different shapes of garden lanterns.

There are many different shapes of garden lanterns. Some are named after their form and others after the localities where they originated.

Kasuga-gata (Kasuga-shape), so named after a Shintō deity called Kasuga, to whom one of the early temples in Nara is dedicated. It is possible that this form was first used in connection with this temple. The lantern has a long cylindrical standard with a hexagonal lamp and base, and is crowned with a curved stone roof tilted at the eaves, and surmounted by a flame-shaped ball. Two faces of the octagonal head are open to admit the oil lamp, and the other faces of the hexagon are carved with the representations of a buck, a doe, and the sun and moon respectively. Shapes very similar to this, but differing in the carved ornament, are the *Shiratayu-gata*, the *Yunoki-gata*, the *Nigatsu-do-gata*, and the *Uzumasa-gata*. Of these the *Nigatsu-do-gata* has a slightly carved standard and the *Yunoki-gata* has a small mushroom-shaped cap instead of the usual ogee curve.

Marugasa-roppon-ashi-yuki-mi-gata.—The name refers to the form of the cap, the number of the legs and the office which the lantern fulfils in the landscape. The cap is a broad mushroom shape similar to the large rush hats worn by country laborers. The body of the lantern is hexagonal or octagonal in

plan, and is supported upon six low legs of a curved form. Such lanterns are broad and low in their general proportions and are mostly overshadowed by the stretching branches of some dwarf tree; they become extremely picturesque when covered with snow, and hence the word *Yukimi* applied to them. There are many varieties resembling this, some with three legs called *Yedogata*, others with four legs. In some shapes the ogee roof-form of cap is used instead of the mushroom shape. Some have a spherical head instead of a square or octagonal one.

Rankei-to-gata.—This is a peculiar kind of lantern invented by Taishin, and is constructed so that the lamp head is supported upon a slender curved stone strut dowelled into a flat stone. It is placed on the side of a lake, stretching out over the water, and should have a crooked pine or some irregular tree reaching out horizontally over it. The form has a curious and unstable appearance and is not often used.

Michi shirabe gata.—This, as its name indicates, resembles a stone mile-post. In one side of the post a hollow is formed to hold the light, and upon the other faces some inscription is generally chiselled.

Riotō gata.—Dragon shape. The form has no resemblance to a dragon except that it has a very attenuated and somewhat crooked standard. The head is spherical with a curved cap. This lantern is generally attached to a high tree.

Miya dachi gata.—The name of this kind of lantern implies that it resembles a temple or shrine in outline. It is square in plan and has a cap like a temple roof.

Oribe gata.—This shape is named after a famous *Chajin* called Oribe, at whose tomb it is used. It is square in plan, the top is similar to the Shihōtoro, but

its standard is peculiarly chamfered at the bottom and it has no base. A rude carving representing a saint is executed upon one face of the standard.

Enshin-gata.—Enshin-shape. Named after the place where it was first used. It is peculiar as having a short cylindrical standard and an elongated head and cap suggesting the more ordinary form stretched or pulled out.

Daibutsu-gata.—Daibutsu-shape. The form resembles more a lamp-post; the standard is long and square in plan and has no base. The head is small and has a small roof of little projection. Its name is derived from the temple of Daibutsu in Kyōto.

A small low lantern consisting only of bowl and cap, and with a small plate-shaped base but no legs or standard is used in connection with the low water basins placed in a crouching position (called *Tsukubai toro*).

Wooden lanterns.

Wooden lanterns are also used in connection principally with summer houses or resting sheds on a garden road. They are simply wooden posts supporting a square framed lantern with paper doors and a roof of board or rushes; generally a rustic form is adopted.

Hanging Bronze lanterns.

Hanging lanterns of bronze are sometimes used suspended to the eaves of the verandah in place of the above, generally for an upper floor. A favourite ornament in Japanese gardens of the better class is the stone tower or pagoda. It consists of three or five stories and is similar in shape to the wooden pagodas, though naturally of ruder proportions and without much detail.

Miniature stone, *pagodas.*

Such stones pagodas are often supported upon curved stone legs. They are surmounted by a long stone finial consisting of several rings and a crowning ball. The name given to them is *Korai-to* or Korean tower, from which it would appear that the idea came from Korea. They have a very

picturesque appearance amidst the foliage of gardens, and assist in imparting to the composition an idea of real landscape on a diminutive scale. Lanterns require to be assisted by trees, plants, and screen fences, and further adorned by means of rocks and stones placed near them. The grouping of surrounding stones is arranged upon the supposition that the lantern occupies the position of the central stone of a group or *kumi kata*. Thus for example if the *Rei shi dō kumi kata* be applied to a *toro* the lantern itself takes the place of the *Taito seki*.

Water-basins.

Water basins in gardens.

The different water basins used in gardens are numerous. Their purpose is to provide water for rinsing the hands, and they are generally placed beside the verandah of the house. In some cases a rock, flat and hollowed on the top, is used. This form is often adorned with a little wooden roofed construction resembling a small shed, which protects the surface of the water from the sun. This kind is called the *Kazari Chozubachi* or Ornamented Water basin. Other kinds are as follows:—

Various shapes of water basins employed.

Natsume-gata.—Date shape, being somewhat like an oval vase in form.

Hashi-gui-gata.—Bridge-post shape, being like the cylindrical pillars used for stone bridges, hollowed out at the top to form a basin, and having an oblong slit in the side representing the mortise into which the bridge railing is fastened.

Doko-gata.—So named from its resemblance to a Japanese cooking stove, cubical in shape, with a curved hollow in the side representing the fire hole. The top surface is hollowed out to form a basin.

Ishi no bin gata.—Stone-bottle shape, being of a form very much resembling Lipscom's filters, with small hands carved on the sides.

Enshoshiku gata.—Named after a star. The form is merely a long cylinder hollowed out at the top.

Kesa gata.—Resembles a rude oval vase or bowl.

Genkai gata.—A curious slender bridge-shape form, with a basin hollowed out in the crown. The idea is that of the curve of the stormy waves of Genkai straits.

Naniwaji gata.—Named after a temple where it exists. It is of a flat octagonal form in elevation and a long oblong in plan. One of its broad sides has a carved inscription. It is supposed to be suitable to be placed at the base of an ivy-clad tree.

Hojo shiku gata.—Also named after a constellation. It is a long parallelopeped in shape.

Seki sui tsubo.—Stone water basin. This is of oval vase-shape, broader at the top than at the base.

Shibo hotoke gata.—This is of a rude oval shape, broader below than above. It has four Buddhist images roughly carved upon it.

Waku tama gata.—This is of a flattish ball shape.

Tetsu no hachi kata.—Meaning *Iron bowl* shape. It is very similar in shape to the preceding one.

Kara fune-gata.—This is rudely shaped, somewhat like a Chinese junk.

Fuji-gata.—This is a basin shaped like the famous volcano Fuji san, the hollow crater serving as water holder.

Anko-gata.—This is shaped like a flat fish, from which it receives its name.

Shiba-Onko-gata.—So named after a Chinese sage for reasons unknown. It is in shape like a rugged hollowed stone, rough on the outside but smooth in

the hollow. It is suitable to be placed on the ground to be used in a crouching attitude. Water basins so used are called *Tsukubai Chozubachi*.

Some water basins are of stone, others of bronze, some bowl-shaped, some vase-shaped, and some like an urn, provided also with a bronze lid. These are variously adorned in relief. Attached to the basin is always a small wooden spoon (*shaku*) for pouring water over the hands.

Water basins are adorned with trees, shrubs, stones and fences. The main idea is to give privacy to this feature of the garden and screen it from other parts of the house.

Garden Bridges.

Garden bridges.

There are many kinds of garden bridges, some in stone, some in wood, and others covered with earth. The stone bridges are often formed of a large rough slab of stone or schist, but more generally of a fine piece of wrought granite slightly arched. Such stone bridges are only used for level positions. Elaborate stone bridges constructed of several spans of stone, supported upon intermediate stone piles, are used in some important gardens, and these are provided with moulded or carved stone parapets and posts.

Stone bridges.

Wooden bridges.

Wooden bridges are of various design. A favourite and quaint form consists of large single planks arranged in a zigzag and supported upon wooden stakes. This kind of bridge is called *Yatsubashi*. Other wooden bridges consist of planks laid crosswise and supported upon arched beams, with an intermediate trestle support from the bed of the lake or stream. When the bridge is long and no intermediate support can be obtained, the curved bearers are strengthened by an arrangement of wooden bracketting from the two banks. This kind is called *Rankan bashi*. So-

Bracketted bridges.

called earth bridges (*Dobashi*) are built of bundles of faggots or rows of small logs laid across a timber framework and covered over with earth. The edges are planted with turf and bound with strips of bamboo and cord to prevent the earth falling off or being washed off at the edges by rain.

Earth bridges.

Some bridges are built of piles of logs arranged in an arch and secured below with leaning timbers, the top surface being covered with earth. This kind of bridge (called *Genkaido bashi*) is employed when the soil is so hard as not to allow piles to be driven in. A rustic bridge is sometimes constructed of a single decayed baulk of timber, or a row of parallel logs, or the side of an old boat. A combination of bridge and stepping stones is sometimes used in a stream or lake, and in such a case a favourite form for the bridge is that of a half-curve arranged so that the outer end shall be higher than the shore end, presenting an appearance as if the bridge had been cut through at some distance from the centre. The section must however be made at a point a little beyond the centre of the rise, after the opposite fall has commenced. This is called the *Nozokibashi*.

Combination of bridge and stepping stones.

Garden Walls, Fences and Hedges.

Use of walls, fences and hedges in Japanese gardens.

Gardens may be bounded by walls, hedges or fences. When walls are used they serve more as a general enclosure to the property, and belong rather to the province of the builder than that of the gardener.

Ordinary enclosing fences.

Such walls are of tiles and mud in alternate layers, of wooden posts and plates wattled and plastered, or simply of wooden palings. They are invariably coped with a projecting roof of boards or tiles. Hedges as garden enclosures are not uncommon, but are more used in rural districts. Such hedges are generally of some kind of cypress or oak and are

carried to a considerable height and thickness. In some of the historical gardens these hedges have been cut into square battlemented forms like the walls of a stronghold.

Framed gateways are sometimes fitted into enclosing hedges, in which case the form of the door opening is occasionally rounded in the Chinese style. Under the general terms of fences and railings may be included most of the constructions employed by the gardener. Fences are used, not only as enclosures, but also in short lengths, are employed as screens to divide one part of the garden from the other, to screen privies, or to hide some unsightly object from view. A very common way of employing fences is to erect two portions parallel and overlapping, leaving a space of about four or six feet between the two for a passage. This arrangement screens the direct view of one portion of a garden from the other, but without forming a closed division. The materials of which garden fences and railings are constructed are bamboo of various kinds and sizes, wooden stakes and boards, twigs, rushes, and reeds. These materials alone or in combination are subjected to various different artistic treatments. We shall divide the different kinds of constructions employed into *enclosing fences*, *screen fences*, and *railings*.

Materials employed for garden fences.

Common boarded fences are sometimes made of close boarding nailed horizontally across vertical posts, very much like a European paling, with or without the addition of a simple Japanese roof. Generally, however, a lighter and more ornamental construction of light frames with vertical strips of boarding is used. These boards are seldom carried quite to the ground, but a space varying from six inches to one foot or more is left open at the bottom, so that the feet only of those immediately outside may be observed. In

Board fences.

addition to this the boards overlap and have an open space between them, which arrangement is produced by nailing each plank alternately on different sides of the thin central ties or cross-pieces. Such fences are often finished above the planking with light open trellising, consisting of intersecting diagonal strips of wood. Above this trellis is sometimes a horizontal plate, which carries cross-pieces supporting a projecting roof of boards, forming at the same time a finish and protection to the whole. The gateways of these paled fences are a continuation of the fencing, the gateposts being merely thicker than the other posts and carried up higher, being surmounted by little copings of boards. The boarding of fences is in some cases ornamented by a method of removing the softer parts of the wood to some depth by means of sand, leaving the natural grain in high relief, which gives a very effective marking to the wood. Another treatment is that of charring the wood in patches, thus giving it a piebald appearance.

Methods of ornamenting the woodwork.

Common bamboo fences consist of strips of split bamboo arranged vertically in two courses so as to present the back of the bamboo on either face. Care is required to allow the knots of the bamboo to alternate; the whole is held together by horizontal half-sections of large bamboo arranged at various intervals and tied with hemp cords to the body of the fence. The ends, corners, and sometimes the tops of these fences are finished with bamboo pipes or half-pipes tied by cords. Another method of arranging the vertical strips which form the body of the fence is to thread them alternately in and out of similar horizontal strips placed between the two faces, so as to form a sort of bold plait.

Bamboo fences.

The cord used to tie together such fences and the manner of tying is a matter of no small importance;

Importance of tying in fences.

sometimes vine or wisteria tendrils are used, and sometimes hemp of a deep brown or black colour.

Bamboo fences are occasionally constructed consisting of thin strips of bamboo diagonally plaited together, forming a sort of ratan work, and strengthened with large horizontal rounds of bamboo and a bamboo border tied to the body of the fence. Other fences are made of small bamboo branches not split, but packed closely together and held between horizontal strips of large size. Thin twigs of a birch-like wood are sometimes employed in a similar manner in combination with large posts and horizontal bands of large bamboo; in such fences the top is left rough and irregular to produce a rustic appearance. Bamboo fences have a very trim and picturesque appearance when new, the bamboo presenting a green polished surface; but they require frequent renewal, as the green colour soon changes to a dirty yellow and the surfaces crack and split.

Gateways and doors in fences.

Gateways introduced into such fences are of various kinds. Every garden should have two gateways; one as an entrance and one called the *Sōji guchi* for clearing away sweepings and rubbish. The *Sōji guchi* is a wooden gate of the simplest kind. The Entrance Gateway consists generally of two vertical posts, with a cross-tie some little distance from the top. Occasionally an extra cross-piece of bent wood is added below to impart a rustic character, also the posts are often rough and of different lengths.

Garden gateways are to be seen in which the cross-tie is purposely broken off at one end to give an appearance of age and decay.

Other gateways exist in which the posts carry a ridge-piece and cross-pieces supporting a rustic thatched roof. In such gateways a tablet of some

piece of decayed wood containing an ancient inscription is placed in the open panel just under the roof. The gate itself consists of boarded doors ornamented at the top with a trellis of diagonal strips.

It is very common to plant a pine or some picturesquely bent tree at the side of a gateway, so as partly to overhang it.

Some gates are partly or wholly constructed of bamboo and rushes and some are of plaited bamboo work (*Ajiro do*). The tea gardens especially abound in quaint rustic form of gates.

Screen fences and their use.

Screen fences are short fences of various shapes used to screen one portion of a garden from another or hide some object. They are principally used against the verandah of a house, behind the water basin, and are then generally about five feet high and three or four feet wide. In form they are sometimes rectangular, sometimes curved at the top on one or both corners, and occasionally they are of irregular shapes. The designs are various.

Various materials used in screen fences.

The grandest style is considered to be that constructed of large vertical tubes of bamboo, placed at narrow intervals and bound together with horizontal bands of smaller bamboo by means of hemp cord of black or brown colour. Tubes of bamboo are sometimes alternated with fasces of reeds or small bamboo, or with round poles of cedar or some other wood which has been parti-coloured by burning. Other kinds consist of various designs in bundles of reeds or bamboo arranged on a skeleton frame and tied together in open bar-work or lattice-work. In one kind the lower part will be of lattice-work and the upper portion in parallel bars, or the same arrangement will be reversed. In another kind the division between the different kinds of work will be diagonal; or a horizontal band of open-work will be introduced in the middle

of a fence otherwise composed of close rush-work. A favourite design consists of a lattice-work fence cut through in the middle with a circular hole or window, sometimes fitted with cross-bars. Some of these fences are made to span the verandah and touch the ground below, and are for that reason curved at the bottom in a quadrant. For the most part they are finished with a border of similar bound reeds or bamboo, but some exist in which a wrought and framed wooden border finished with a framed trellis is used, much resembling the border of a house screen or gallery doorway. Occasionally part is filled in with boarding.

Fences having window openings.

The names of the different kinds employed are the following:

Japanese names for various screen fences.

Chasen bishi Sodegaki.
Yaye Sodegaki.
Korai Sodegaki.
Hosogetsu Sodegaki.
Yoroiyata Sodegaki.
Koshi Korai Sodegaki.
Teppo Sodegaki.
Fusuma Gaki.
Enjo Sodegaki.
Kicho-gaki.
Ensobishi Sodegaki.
Nozoki-yaki.
Mokusa-goshi Taimatsu no Nijugaki.
Koboreme Sodegaki.
Mitoshi Gaki.
Komachi Gaki.
Kasane Gaki.
Tatte ai Gaki.
Enso kicho Gaki.

Railings placed round gardens are generally of narrow standards of whole bamboo placed with intervals and connected by cross-pieces of wood by bamboo

Garden railings.

tied to them. The bars are of alternating heights. Creepers and climbing scented flowers are planted against such railings, but not so thickly as to hide the open bamboo-work. Another kind of railing consists of bamboo branches with the leaves on, crossing diagonally and tied at the crossings with hemp cord, presenting a rude kind of lattice work.

Movable screen fences.

In the gardens of the nobility sometimes high movable screen fences are used for the purpose of forming a temporary enclosure for games of ball and other sports. These are called *Mari-oki*. They are framed of wooden bars of considerable height and finished at the top with ornamental open lattice-work. Such screen fences are often lacquered or ornamented in colour.

Common gardens.

Next to the *Sansui-niwa* are what are called *Hira-niwa* or Common Gardens. These gardens have no artificial hills, but the stones and rounded shrubs are sometimes grouped so as to suggest mountain scenery. The distribution of these groups is somewhat similar to that in the *Sansui* gardens, and the same names are applied to the principal stones. The *Hira-niwa* is also divided into three styles of *Shin*, *Gio* and *So*, according to the rough or finished character displayed.

Gardens of this type, when level, may be supposed to represent either a mountain valley or a sea beach; in the former case the surroundings should be steep, thickly planted, and imposing; in the latter case the landscape may be open and placid. A *Hira-niwa* of the *So* or rough type sometimes consists of little more than a central group of boulders, trees and lantern around a picturesque well, with one or two smaller groups of stones and plants, the flat open portion of the garden being ornamented with meandering lines of curiously shaped stepping stones. The principal stones of such a garden are, however,

distinguished by the same names as in the more complete and finished examples. The Shigoseki, Haiseki and Nijinseki are invariably introduced.

Tea gardens.

The *Cha niwa* or gardens for tea ceremonies come next in order. They are generally remarkable for their extreme simplicity and barrenness. The ceremonies necessitate that the guests repair to a sort of resting shed some distance from the tea room, and the ground is chiefly occupied with quaintly arranged path stones, sometimes wrought and sometimes irregular in shape. In connection with these path stones are various accessories, such as water basin and surrounding stones, lantern, and a high stone called the *katana kake ishi*, because by its means the guests are enabled to hang up their swords on a high bracket attached to the wall. A few shrubs, and little groups of leafy trees are also introduced, and sometimes a picturesque well. In character these *Cha niwa* are generally made purposely somewhat wild and irregular. Moss is much cultivated in them; and in the lanterns, fences, gates and other accessories an appearance of age and ruggedness is sought after.

Special style of tea garden.

The *Tamagawa Cha Niwa* is a special style of *Cha niwa* containing a stream running through it. The name originated from the garden of a famous *Chajin* named Rosha, who established a *Cha niwa* on the banks of the Tamagawa. Such a garden contains a narrow winding stream lined with various stones and crossed by a plank bridge. There will be one stone lantern and a group of larger boulders, grasses and trees, and the plain parts of the garden are crossed by the usual stepping stones arranged in an irregular winding manner.

Passage ardens.

The *Roji niwa* is another kind of garden used for narrow courts or passages. The design is very simple, consisting of a continuous row of stepping stones and an occasional group of trees and shrubs.

SITUATION DE LA VIGNE DANS L'EMPIRE DU JAPON.

D'APRÈS LES RAPPORTS DE M. FOUKOUBA YAHITO, DIRECTEUR DES VIGNOBLES D'HARIMA, ET LES RAPPORTS OFFICIELS DU MINISTÈRE DE L'AGRICULTURE DU JAPON, ET TRADUITS DU JAPONAIS

PAR J. DAUTREMER,

INTERPRÈTE DE 2e CLASSE À LA LÉGATION DE LA RÉPUBLIQUE AU JAPON.

[*Read Juin, 1886.*]

La vigne se trouve répandue un peu partout, mais c'est surtout dans la province de Kôfou, au centre de l'île Nihon, qu'on s'occupe de sa plantation. Depuis les temps anciens, d'ailleurs, les habitants de cette province ont toujours récolté le raisin.

Si l'on en croit la tradition, la découverte de la vigne remonte à 700 ans, (sous le régne de l'Empereur Gotoba) (1185 c.à.d. 2e année de Bounzi) et a été faite par deux paysans dans les montagnes du Kôfou, canton de Yassirô, village de Kamiivasaki. Aménomiya, et Kagayou (c'etaient les noms de ces deux individus,) ayant un jour remarqué dans la montagne un plan de vigne sauvage, et ne sachant ce que c'était, le prirent et le transportèrent à Ziô-Seï-zi, jardin qui leur appartenait; ils y donnèrent tous leurs soins et s'efforcèrent de le cultiver. Au bout de cinq ans, à force de précautions et de soins donnés, la vigne était déjà grande et elle poussa des branches qui ne tardèrent pas à donner des fruits. Etonnés et joyeux à la fois de la découverte qu'ils avaient faite, Aménо-

miya et son ami, n'en continuèrent que mieux leurs soins à la plante qu'ils trouvaient extraordinaire et songèrent au moyen de la propager, de sorte qu'en 1193, ils en possédaient déjà treize plants.

Plus tard, ayant développé cette culture, et étant parvenus à avoir un nombre considérable de ceps, ils en plantèrent des champs entiers, et c'est de cette façon que commença le raisin de Kôfou qui était, et est encore aujourd'hui fort estimé.

La province de Kôfou, est donc absolument le berceau de la vigne Japonaise, et, bien que la vigne se rencontre partout plus ou moins à l'état sauvage, les vraies plantations de vignobles actuellement en exploitation, proviennent généralement de là.

La vigne est de deux espéces : la *Vitis vinifera* et *la Vitis labraska ;* mais, en réalité on ne cultive que la première. Elle est, en effet, tres-renommée pour les fruits qu'elle donne : la seconde, bien qu'encore fort supérieure à celle que l'on trouve en Amérique, n'est pas si bonne que la *vinifera ;* on la trouve partout dans les montagnes, elle y pousse comme l'herbe. Les provinces où on la rencontre en plus grande quantité sont : Etsiou, Kaga, Noto, Hida, Moutsou, Ouzen, Ougo et le Hokkaïdô.

Dans l'Etsiou et le Kaga, aussi bien qu'au Hokkaïdô, la variété de vignes à l'état sauvage est considérable ; on en rencontre jusqu'à 12 espèces différentes, et parmi elles se trouvent des pieds fort gros datant de plusieurs dizaines d'années. Visitant un jour avec un de mes amis les montagnes du Kaga, il m'est arrivé de voir un plant ayant 1^{m}, 80^{c} de tour, et dont les branches couvraient une superficie d'un hectare 20^{c}, et ayant donné 1200 kg. de fruit. Les pieds de vigne de cette dimension ne tout pas très-rares et j'en ai vu encore plusieurs exemples a Miyakézima dans la province d'Idzou. Il n'en est pas de même en Europe où une vigne comme celles d'Oran ou de la Kasba, en Algérie, d'un diamêtre de 0.24^{cm}, couvrant une superficie de 120m. et donnant 1000 kgs. de fruits, est chose tout à fait prodigieuse. Malheureusement les Japonais, ignorant, autrefois toutes les propriétés de cette plante, la laissaient pousser naturellement comme les autres arbres, sans lui donner les soins speciaux qu'elle réclame pour arriver à produire des résultats satisfaisants ; ce n'est que dans ces derniers temps qu'on a commencé à s'occuper de cette plante précieuse et qu'on prend intérêt à ses produits.

La *Vitis vinifera* cultivée au Japon, donne des produits de trois

sortes : rouges, semblables au "*Châblis;*" noirs, comme le *Frankenthal;* et blancs, comme le *Riesling*. Ces trois espèces sont répandues dans le Kôfou. Le raisin noir se trouve également dans les environs de Kiôto, et c'est le meilleur raisin noir qui existe au Japon.

Autrefois on ne cultivait la vigne que pour manger le raisin comme fruit. Le plant sauvage offre une très-grande vitalité et le rendement est considérable. Mais depuis qu'on fait des essais de culture sérieuse, on a cherché à le greffer et à le transplanter, pensant qu'entre les différentes variétés on arriverait à en trouver une capable de fournir de bonnes récoltes et une qualité de raisins à vin.

Pour propager la vigne, on emploie deux moyens également usités en Europe. La 1ère manière consiste à mettre en terre des branches détachées des ceps, autrement dit à bouturer ; la seconde est la plus usitée et elle réussit, d'ailleurs beaucoup mieux ; c'est celle qui consiste à provigner les branches tout en les laissant encore fixées au pied. C'est, au reste, le moyen dont se servent en France les vignerons pour renouveler leurs plantations.

Les Japonais choisissent pour leur vigne de préférence des terrains en pente, et pierreux ou sablonneux, et voici comme ils procèdent pour la plantation : après avoir creusé un fossé profond de 1m, 20cm et large d'environ 2m, et avoir fait des canaux de façon que les eaux puissent s'écouler à l'entour, ils remplissent le fossé de fumier et de terre et plantent. La plantation se fait de préférence en automne, sauf dans les endroits excessivement froids du Hokkaïdô, où on la fait de préférence au printemps. Pour fumer, on se sert de poussière d'os, d'écorce de riz, de fumier en poudre, de marcs de saké (vin Japonais) ou de marcs d'huile, enfin d'engrais humain. Mais ces fumiers ont chacun leurs propriétés spéciales. Ainsi la poussière d'os, l'écorce de riz et le marc de saké donnent au raisin un goût sucré et en augmentent le volume. Le fumier proprement dit, et l'engrais humain donnent plus de force aux arbres et serrent davantage les grappes qui sont, par suite, plus fournies. Il est donc indispensable d'employer un mélange du tout pour obtenir de bons résultats.

Taille.—La taille est pratiquée en automne, de manière à laisser au pied une hauteur de 1m 80cm et de façon aussi à laisser, en dessous de la section, naissance à deux ou trois branches pour le printemps

prochain. L'été venu, on coupe les feuilles et les jeunes pousses de façon à laisser pénétrer jusqu'aux grappes le plus d'air et de soleil possible. Quant aux soutiens des branches, on les fait avec des bambous, également à la hauteur de $1^{m}\ 80^{cm}$, sur lesquels on étale les branches des ceps. Cette manière de procéder, est, d'après les Japonais bien préférable à celle employée en Europe.

Essai de vin.—La première idée que les Japonais eurent en plantant la vigne, ce fut, naturellement d'en récolter les raisins et de les manger tels quels. Toutefois il est dit, dans les livres anciens que les habitants du Kôfou s'en servaient pour faire une liqueur (probablement une sorte de vin). Dans quel but, on l'ignore ; car il est certain qu'ils ne le buvaient pas.

Ce n'est qu'en 1875 qu'un habitant du Kôfou résolut de faire du vin de raisin ; mais, outre qu'il ignorait les anciens aussi bien que les nouveaux procédés, les raisins qu'il employa n'étaient pas en maturité suffisante et il ne réussit pas. L'année d'après (1876) un, nommé Oto Matsougoro, revenant de Californie où il avait étudié la manière de faire le vin, voulut aussi faire un essai à Kôfou ; et, bien que le produit qu'il obtint ne fût pas fameux, cependant il était bien supérieur à celui de son prédécesseur. Aujourd'hui ce même vigneron fait chaque année 200 hect. de vin blanc et autant d'alcohol. Mais ce vin ne doit pas être bon ; car il m'est arrivé de goûter plusieurs fois et de différentes espèces de vins de Kôfou, chez le Ministre de l'Agriculture, et je dois avouer qu'il était détestable. A l'heure qu'il est, dans le Hokkaïdô, ainsi que dans les provinces d'Harima et d'Ovari, on fait plusieurs milliers d'hectolitres de vin, et cependant les plants n'ont encore que 5 ou 6 ans, et les grappes sont naturellement peu fournies. Il n'est donc pas douteux que, dans deux ou trois ans, la production ne se chiffre par 20 ou 30,000 hectolitres. Mais ce qui est douteux c'est que le vin soit buvable d'ici longtemps. Ainsi celui qu'on récolte actuellement est mélé par les marchands Japonais avec un vin européen quelconque, et ce mêlange est ensuite vendu aux Japonais pour du plus pur Bordeaux.

VIGNES D'EUROPE ET D'AMERIQUE IMPORTÉES AU JAPON.

La première vigne européenne transplantée au Japon fut donnée au Shiôgoun par l'Empereur Napoléon III en 1868. Il en vint ensuite de

Isabella et Concord en Amérique ; puis on importa le Frankenthal d'Autriche, ainsi que d'autres vignes de France, que M. Maeda Masana rapporta lui-même. Enfin la Californie fournit au Japon un nombre considérable de plants, et l'on peut dire qu'en moyenne, il en est entré plus de 200 sortes au Japon.

Les essais de culture ont été généralement faits à Tokio (Yédo) dans le jardin botanique de Mita, mais tous n'ont pas réussi. Ainsi pour la vigne européenne, le terrain de Tokio est beaucoup trop humide et boueux, et la vigne, quoique y devenant très-grande et y poussant fort bien, ne donne aucun fruit ; elle pousse tout en branches et en feuilles. La vigne américaine seule rapporte à Tokio ; mais les grappes, bien que superbes, ne sont pas de premier choix ; elles sont mêmes, certainement très-inférieures aux raisins Japonais purs. Aussi, maintenant, en a-t-on abandonné la plantation qu'au premier moment on avait essayé partout. On a compris que le seul moyen d'avoir de la vigne, était d'introduire des ceps d'Europe ; que ceux-là seuls pouvaient donner un produit convenable. Actuellement, c'est la seule importation vignoble que l'on fasse.

Les principales plantations se trouvent dans le centre, à Harima et aussi à Kiousiou. Dans cette dernière île, le *Muscat Pinot* et *le Chasselas* réusissent à merveille, grâce à la constitution géologique du sol ; sec, et par suite, très-favorable à la vigne. Le *Chasselas* réussit fort bien dans la province d'Harima et y donne des grappes d'un gros volume et très-fournies.

Le raisin de Palestine n'est planté que depuis deux ans, et donne déjà de très-beaux résultats. L'année dernière, M. Foukouba Yahito, directeur du jardin école de Harima en a donné une grappe à M. Sarazin, Conseiller au Ministère des Affaires Etrangères, qui lui-même en a fait présent à M. le Ministre de France ; la grappe pesait plus de 3 kgs, et c'était la première belle grappe récoltée.

Les écoles de viticulture au Japon.—La vigne réussissant au Japon, et le terrain se prêtant fort bien à sa culture, le Gouvernment a encouragé les cultivateurs à se livrer à la récolte du raisin. Il a donné lui-même l'exemple en créant des écoles de viticulture, et en faisant venir d'Europe un nombre considérable de jeunes plants. Il n'est donc pas douteux que d'ici peu le Japon ne devienne un pays vignoble. On a

introduit dans l'Ecole d'Harima le *Gamay de Bordeaux* et le *Pinot Noirien*, et on espère pouvoir sous peu en faire des plantations suffisantes pour en tirer du vin.

Le jardin d'Harima a une superfie de 80 hectares :

Celui d'Ovari, 50 hectares,
Celui du Hokkaïdô, 40 hectares.

Les vignes qui réusissent le mieux dans ces endroits sont les plants *Pinot Gris ;* cependant ou y trouve également :

Gamay de Bordeaux
Bordeaux Blanc
Baltet noir
Meslier blanc
Meslier noir
Frankenthal
Folle Blanche
Charbonneau
Muscat de Frontignan
Zinfindal
Riesling
Malvoisie, etc., etc.

Maladies de la Vigne.—La maladie n'a pas épargné la vigne au Japon et l'*Oïdium* et la *Brouissure* existent dans les vignobles. Ces maladies ont commencé à germer en 1867, et depuis, les pieds de vignes en ont plus ou moins souffert. On emploie pour l'*Oïdium*, le remède ordinaire, c'est à dire le soufre ; quant à la *Brouissure* on n'a pas encore trouvé moyen de la guérir. La grande fréquence de ces maladies au Japon vient de ce que les pieds sont taillés beaucoup plus grands qu'en Europe, et sont, par conséquent plus difficiles à soigner.

Les insectes ont aussi leur bonne part dans la maladie de la vigne ; mais ils sont rélativement faciles à détruire quand on a soin des plantations, et surtout quand on n'a pas affaire au *Phylloxera Vastatrix.* Ce dernier insecte n'était pas encore apparu ici ; mais l'année dernière (1885), il a fait son entrée, et il a fallu, pour s'en préserver les années suivantes bruler tout le terrain occupe'par les pieds attaqués. Le

reméde est radical ; mais peut être ainsi les autres vignobles seront-ils préservés. Les Japonais croient que cet insecte a eté apparté d'Amerique lors de l'importation de vignes en 1881.

Rendement.—Avant l'apparition de l'oïdium, ou récoltait de 17000 à 20000 kg. par hectare dans les provinces de Kôsiou (Kofou) Kavatsi et Yamasirô ; mais à partir de 1867 le rendement est tombé immédiatement de 3000 à 3,500 kg. Cependant, à l'heure qu'il est, la culture de la vigne reprend, et il est à espérer que, dans peu de temps, grâce aux soins que l'on donne, la maladie disparaissant, la production augmentera.

Les qualités de vignes qui rendent le plus sont : *Zinfindal et Folle Blanche.* La moyenne est en effet de 18.000 kg. pour un hectare après 5 ou 6 ans de culture. Ces plants sont bien supérieure aux plants Japonais et leur résistance à la maladie est également très-grande.

L'année 1885 a été peu favorable, et les rendements ont été faibles. Il n'y a guère que dans le Kôsiou et le Hokkaïdô que la vigne ait réussi. Les grandes pluies qui sont tombées à l'époque de la floraison dans les vignes de Kavatsi, Karima, Ovari, et les inondations qui suivirent, détruisirent presque tont ce qu'il y avait, et les vignobles souffrirent beaucoup.

SITUATION DU JARDIN VITICOLE D'HARIMA,

DIRIGÉ PAR M. FOUKOUBA YAHITO EN 1883.

La pousse a été tardive et les bourgeons ont été très-en retard sur ceux de l'année précédente, les fleurs n'ont paru qu'en Juin. Malgré cela, la maladie a été presque nulle et le climat ayant été favorable, on peut dire l'année a été bonne.

Vers le mois de mars on a fait de nouvelles plantations de ceps.

13.000 ceps dans le 1re division
7.600 " dans la 2e "

JAPON.

Les endroits en couleur indiquent les provinces où se trouvent les vignes.

Hokkaido - Ecole de viticulture - Vignes Européennes et américaines.

Moutsu
Dugo
Ouzen
Noto
Etchiou
Hida
Kaga
} Vignes Japonaises.

Kai = Kôfu - Vigne Japonaise dite de Kôfou la plus recherchée au Japon.

Owari - Vigne Japonaise.

Harima - Grands vignobles appartenant à l'Etat et où on acclimate les vignes d'Europe.

HOKKAIDO

MUTSU 陸奥

OUGO 羽後

OUZEN 羽前

NOTO 能登

ETCHIOU 越中

KAGA 加賀

HIDA 飛騨

KAI 甲斐

KOFOU

TOKIO (Yedo)

Yokohama

OWARI 尾張

HARIMA 播磨

SIKOKOU

SIOU

KIOU

HOKKAIDO
道海北

Sapporo

ces deux espèces de ceps sont les bons ; il en restait environ 18.000 qui n'étaient pas de première qualité on les a entouré de soins spéciaux et plantés à part ; car ils paraissaient si faibles qu'on croyait n'en pouvoir faire aucun usage. Cependant tel n'a pas été le cas, et bien fumés, ils sont devenus très-forts. Les vignobles d'Harima comprenaient alors : 85,951 ceps dans un espace de 1800 m.q ; mais le terrain n'est pas entièrement occupé et il reste encore actuellement 1100 m.q. à planter, quoi qu'il en soit, les espèces dont les noms suivent sont représentées à Harima :

Aramon	*Bordeaux blanc*
Noir Hambourg	Burger
Noir Malaga	*Cot à queue vert*
Noir Zinfindal	Cununhal muscat
Bourgogne noir	*Chasselas de Fontainebleau*
Lambard noir	
Muscat noir	*Cleirette blanche*
Prince Noir	*Charboneau*
Jura Noir	Catowba
Zante noir	Delaware
Raltet noir	Diana
Bordeaux noir	Feher Zagos
Fendant rose	Isabella
Tokay couleur flamme	Johannisberg Riessling
Gutedel	Larga bloom
Hambourg d'or	*Meslier blanc*
Vert Hongrois	*Meslier noir*
Chasselas doré	Mission
Gamay noir	Moscatel
Harness muscat	Muscat Hambourg
Hartford prolific	*Muscat de Frontignan*
Malaga moscatel	Orléans Riesling
Préio de Malingre	*Damas pourpre*
Palestine	Prince Albert
Pæriena	*Pinot noirien*
Pinot blanc	*Pinot noir hâtif*
Pinot gris	*Pied de Perdrix*

Red cormchon	Red Munson
Hongrois rouge	Sultane
Malaga blanc	White nice
Muscat d'Alexandrie	
Tokay blanc	Napoléon blanc

Les vignes Japonaises du Kôfou y sont aussi représentées et soumises à des cultures spéciales.

Des différentes espèces qui précédent, on avait en 1882 planté 50,900 ceps ; mais les deux tiers seulement ont réussi ; le reste a péri ; on a fait à l'automne 106,750 boutures, dont on espère beaucoup de bien pour l'année prochaine.

MALADIES ET INSECTES.

Un tout petit insecte, le Kin Ki Si (petite tortue dorée) avait fait son apparition en 1882 ; mais cette année, grâce à la temperature beaucoup plus froide de l'hiver, il a disparu entièrement. Les insectes ne font, d'ailleurs, pas ici de grands ravages, et sont faciles à éviter ou à faire disparaitre. Seules, les maladies de la vigne, telles que l'*oïdium* et la *clavelée* sont à craindre. Cependant, sous ce rapport aussi, la vigne à Harima, est bien partagée. Est-ce grâce à la formation du sol, au climat, qui fait que la vigne est plus résistant ici qu'ailleurs ? Quoiqu'il en soit, les maladies de la vigne tout généralement rares et, en tous cas faibles. Il n'y a jamais, à Harima, de grandes pertes à déplorer de ce fait. Le coulage est assez sérieux, et il est fort probable qu'il faut l'attribuer à la trop grande humidité du climat. On y remédie autant que possible en fumant beaucoup la terre, et dès le commencement de la floraison, on arrose les pieds avec du fumier liquide.

RENDEMENTS.

Les rendements tout, nécessairement encore très-faibles. Les arbres plantés depuis 4 ans, ont cependant donné :

Bordeaux noir	122 kg. 50
Baltet noir	105 kg.
Hongrois vert	52 kg. 50

Les résultats sont peu brillants ; mais il faut tenir compte de la jeunesse des ceps. Les grappes, d'ailleurs, bien qu'en petite quantité, étaient bien fournies. Le *Baltet noir* a donné le plus, mais la proportion été faible, un cep donnant en moyenne 1 hectg. 89.

Le terrain d'Harima est cependant très-favorable à la vigne, et le raisin y est très-bon. Si la production jusqu'à présent est si peu considérable, c'est que les ceps sont la plupart encore impropres à donner avant quelques années. Par exemple le *Pinot Noirien* et le *Gamay noir* n'ont pas encore rapporté une grappe.

Somme toute l'état actuel du jardin viticole d'Harima peut être considéré comme prospère et, il est, en ce moment en voie d'amélioration continue. Il est à espérer que les ceps qui en sortiront seront en assez grande quantité pour former de vignobles, et assez bons pour que le Japon puisse un jour faire du vin sinon aussi délicat que le vin de France, du moins bien supérieur à celui que l'on fabrique actuellement en Californie.

AN AINO-ENGLISH VOCABULARY.

COMPILED BY THE REV. J. SUMMERS.

Note.—The following contractions have been used in parentheses: D. (Dixon); Den. (Dening); H. (Horobets Dial.); Kam. (Kamtchatka Dial.); Kl. (Klaproth, in *Asia Polyglotta*); Kr. (Krafto, Sagalien Dial.); S. (Saru Dial.); Sch. (Scheube); Sieb. (Siebold); U. (Usu Dial.); Y. G. (Yezo Gosen 蝦夷語箋); B. (Batchelor); Db. (Dobrovski); Pf. (Pfizmaier); Dv. (Davidoff); MS. (Matsumai MS.).

A.

A (variation of Ya), An interrogative particle (final).
A, One (Db.), a contraction for Ari.
Aan mi kara (S.), Defeated.
Aanga (Kr.), The winter duck (Kam. aangich).
Aapa, Mother (Kam).
Aara, Name of a bird.
Aba (Apa), Doors; door.
Aba ashi, Shut the door.
Aba biraspa, To open the door.
Aba ru, The threshold.
Aba shia, Entrance.
Aba shirara, Push open the door.
Abas-op, Hook to land harpooned fish.
Aba uspe, Door.
Abe (Ibi, Ibe), Fire.
Abe ari, To make a fire (B.).
Abe bushi, Flying fire.
Abe guru (B.), To draw near the fire.
Abe hetoku, To get fire; 生 produce fire by friction of wood.
Abe kamoi, The fire-god.
Abe keshi (kes.), A firebrand.
Abe meri meri, A spark (B.).
Abe ni, Fire-wood (B.).
Abe nipek (B.), Flame of fire (m. as Abe-pusi or Bushi.
Abe oi, A fire-place.
Abe op, A small fire.
Abe rui, The fire is burning; (S.) flame.
Abe sam, Fire-place (Sch.) (S.).
Abe shakunto, A kind of bronze (Db.).
Abe tsügu ni, A billet of wood (Db.).
Abe unji, To make a fire.
Abe ush, The fire is out (B.).
Abe uvari, To break up the fire (Db.).
Abiru, To ripen.
Abu, To vomit.
Abukashi (Jap. ayumu), To walk, same as Ap'kash, Ab'kash'.
Achabo (S.), Parents; father; (Sch.) *met.* an old man; designation of father's brother (B. Achapo).

Achi-an guru, A visitor; a guest.
Achi kite riki, To hop (S.).
Achi uno, Throwing a spear at a stag.
Achiu wa, One who stabs; cf. Op'achiu, to throw a weapon.
A-e (S.), To eat.
A-echi korobe, Red prawns.
Aën-kik, To be struck (Kr. and S.).
Aën no ikiri, Life time 生涯.
Afunka (or Apunka), A shuttle on which the thread is wound.
Afunke, To cause to enter; to put in.
Ahane e aikap, Cannot enter (S.).
Ahanra sambe, An owl (B.).
Ahesi yakun to, Violet coloured copper.
Ahuha (v. ohak), Shallow shore; very shallow.
Ahun, To enter.
Ahunke rochige, To put in prison.
Ahupp, A present; or, Ahupp kara pei.
Ahupp kara, To receive (B.); Machi ahupp kara, To take a wife (B.).
Ahuppte, To bring for us.
Ahupu kara, To give; to bestow.
Ahupu karambe, A thing received (B.).
Ai, An arrow; a thorn.
Ai-ai, An infant.
Ai-ai chish an, A child crying.
Aibi or Aibe, Mother-of-pearl fish (Jap. awabe).
Ai-kanji, The lowest part of an arrow; the notch for the string.
Aikap, Cannot (var. Aigapp).
Aikap na, Could not.
Ai-na, To roast.
Aï-nan, The shin bone of the stag, used in making arrows.
Ai-ne, Finally 終.
Ai-ne shiriki (shikareba), Indeed 然.
Aino, A man.
Aino butta, All men.
Aino moshiri, The island of the Ainos (Yezo), e.g. Aino-moshiri nuburi isho poronno an, 'There are many bears in the island of Yezo.'
Ainu betne, To enjoy one's self, to rejoice.
Airamasho (S), Fond of.
Airamasho wa a-e, Fond of eating.
Ai rapp, The feathers on an arrow.
Airo 鱸, A perch (Labrax Fam.).
Ai seta, My dog (Kr.).
Ai-shupara, Lower part of an arrow.
Ai-sopp, Tube for arms; a quiver.
Ai-suwe (S.), To lie down.
Ai tu nō, The cuttle fish.
Aï ya, Called; e.g., Nekona aï ya? What is this called?
Ai-yen kechi, A kind of fish.
Aji (Jap. oji), An uncle; an old man.
Akara (A-akara), Are made (S.), passive form.
Akara kara (S.), To sew; cf., Yau ka-oka.
Akari (S.), Than, cf., Akkari.
Aken naku (sayō), Yes.
Aketek (Hotate), A bivalve; shell-fish, the nautilus.
Akianji (Akiaji), Salmon.
Akibets (Askibets), A finger.
Akik', To strike; to slap; (e.g. Arokai kik', I strike) cf., Kik.
Akik'-kane, A bell to be struck (S.).
Akisusu kuri, The bear feast in autumn (Sch.).
Akk' (Aku), To drink; cf., Iga, Iku.
Akk, To shoot.
Akkari, To exceed; surpass; (S.) v. Akari
Akke, To fall in quantities; to increase, (Db.).
Akkira (Adzukaru), To be intrusted with.
Akor (I-koro), A mine; riches, money (B.).

Akuré, To offer; or, I offer (wine etc.).
Ama (Amu), To place, to put down.
Amáma (Jap. mama), Boiled rice; rice; millet; bread.
Amáma chiri, A sparrow (Mos.).
Amáma chkapp', A sparrow (Db. in Matsumai only).
Amáma chupp, The eighth month.
Amáma tagi or tangi, A rice cup.
Amampa-ta-kiriri (Jap. kirigisu), The green field-cricket.
Amb', The thigh bone (Db.).
Ambai, A wooden float for large nets.
Ambai yaya, A crab-fish.
Ambe (cf. Wambe), Ten.
Ambe, State; condition? Jap. ambai.
Ambe, 3rd sing. of verb "to be" (B), (cf. an, be).
Ambi, Truth; the lower part or flap of the ear (S.).
Ambi, To become (S.).
Ambo chichi, To pinch (B.).
Ami, To cover (D.); to clothe.
Ami, A nail (Nagel) (Sch) cf. amu.
Ami-a huk (U.), To undress.
Ami bami, To dress.
Ami he sembi (S) (Pf.) A wedge.
Ami-kiku, To know.
Ami-kiri (S.), To remember (oboye); to recognize (as in the street).
Amip' (S.U.), Clothes, prob. for Amibe, 'clothing thing.'
Amoi nin (A), The lower part of the arm; cf. Amunin.
Ampa (Kl. Kr.), Dumb.
Amu, Finger-nails (contr. Am').
Amu-chit'pa, To pinch.
Amunin, The fore arms; maku-amunin, the upper part of the arm.
Amush'pe (S.), A crab; the pincer.
An, To have; to be 有, (like orimasu) (for pres. or fut.).
Ana goro, Was; did.
Anak (B.), Sign of the nom. case.
Anaki-ne (S.), The same as Anakune.
Ana ku-ne, Sign of nom. case.
Anatsuka (aritemo), Even if there is.
Ana wa, past tense of An, to be.
Anba, To clutch.
An-be-ne, It is indeed (Pfz.).
An chi kara 夜, Night.
An chi ki (arutoki ni), Sometimes.
Ande, Lying down (H.)
Ane, This; him; her.
Ane, Thin, lean, small.
Ane ampi, Small girdle.
Ane-kane, Thin metal.
Ane-kut, A thin girdle.
Ane-ōtta oman-de, To send to him.
Ane-oshaganke, To call this (him).
Ane-ru, A small road.
An-gara, To make; v. Kara.
An-guru, This man (Tan=this.
Angusu, Strict; severe; also (Sch.).
An-hime-karu.
Ani, With (Pfz.) (S.), Postposition 'with,' 'from.'
Ani e-ramu-petek (U.), You don't understand.
Anip-kara (S.), To sew; to make clothes =Amip-kara.
Ani-utare (? Ane-utare), They.
An koro ka (areba), If there is.
An koro kai ki (aredomo), Though there is.
An koto ma an (arukoto mo aru), Something there is.
An-koto-mambe, Right, proper.
An-koto-ma-se, It is so.
An-kunip-tek (S.), Will.
Annankora (arō), There will be.
Anne an, As if there was.
Annoshike (Jap. ya-chiu), Middle of the night.

Ánnu, e.g., Teta ánnu (S.), To set there.
An nu no a ach'ire, The man falls (in contest).
Ano (K.), Finger-nail, prob. for Amu, q.v.
Anodare, Man (Mensch), adult (S.), (kudare).
An-okai, You (v. Ogai, person, man).
Anokai, You (v. An-okai) and Tan-guru.
Anomare, To dye.
Anoshiki, Somewhere (S.).
Ano-ya-ne-nep, It is nothing.
Anoye, To twist (nejiru).
An-ramu-ochiuye, Tagai ni tokushin, (hajiku), to agree together.
An-ronna-kushi-ne-na, He will have been murdered.
Anto shike, Middle of the night.
Anu (arinu), Have not.
Anukari, To see.
Anun, Another person.
Anun-i-koro piske wa, As one counts the goods of another.
Anushi ke, A harbour; to fasten up a ship.
Anushi ke (S.)? Bear's den.
Anu-wa, As something exists.
An'yakka, It may be, potential form.
Anz kari (K.), (Kl.), Night.
Aoin kari, 透見 (sukimi).
Aoka (S.), (U.), I (S.), You; Aoka utare (U.), We.
Ap', Fish-hook.
Apa, (cf., Aba).
Apa or Apa-apa, Dumb; to converse by the hand in dumb show.
Apa maka (S.), Open the door, *i.e.*, push open the door.
Apa seshiki (S.), Shut the door.
Ape-tumbe (S.), Butterfly, large (? Admiral), leopard spotted, brown.
Ap'kashi, To walk.
Apotki, A kind of rush.
Apotki teshikau, To bind.
App'ashi (S.), He is come.
App'kashite arăppa, Walking came.
Apto, Rain; Apto as, it rains, or Apto ash.
Aptō ashite, To cause to rain.
Apu, Ice.
Apuku, or Ap'ku (S.), Deer (buck).
Apundo, Gentle.
Araga (Araka), Pain; ache.
Araki, Semicircle, or segment (S.).
Aram'a (S.), Lizard.
Arapa, To come (S.), or go, v. ariki and ek.
Arapp, Pimples on the face.
Ararai yeye, To level off (as rice measured in the *Shō*); shōke.
Arashikaye oman, Walking without carrying anything.
Arawambe, Seven; Arawambe ikashima wambe, 17.
Árba ána, (cerem.) "Fare ye well" (Sch.).
Ari, To light.
Aria kitte (S.), Come here.
Ariki (Arigi) (K.), To come.
Ariki-gema (S.), Left leg; Ariki tek, left hand; cf. Hariki.
Arip' (Kr.), An egg.
Ririka (Kr.), A rope; Ane aririka, a thin rope.
Aririka sai kara, To coil a rope.
Ari-shiki, One-eyed.
Ari-shiui, Once; cf. Ashiui.
Aro-baigaru-ushi, Easy spring, v. paigaru.
Arokai chikuni toanta nogar, I set a tree there (Sch.).
Arui-kumbap, Red chrysalis (S.).
Aruka (cf. Araga), To itch? pain.

Aruwasi ikashima wambe, 17.
As, (Kl. Y.) Night.
Asabo (S.), Uncle, old man.
Asagi (asangi), Light blue colour (Jap.).
Asakara 麻, Hemp.
Asam (Asham), Inside surface, pet'-ashem, in the back, opposite.
Asara, A clam.
Ase seka (cf. Shesheka), To boil.
Ash', To fall (rain), v. ass' and hash'.
Ashapp'she (S.), To row (on river).
Ashi, To build (tateru); chisé ashi, to build a house or shut up a house.
Ashi (S.), Shut! Apa-ashi, shut the door; Nishatta ap'to ash', it will rain to-morrow.
Ashibets (S), Finger; Poro ashibets, thumb.
Ashi gi, To pull up.
Ashi kai-wa, Since something is.
Ashika no oman, Creeping along.
Ashiki, Five (ashiki-nepp).
Ashiki ne hott', 100.
Ashiki ne ikashima wambe, 15.
Ashiki ne papa, Five years.
Ashik ni (for Jap. nin) Five men.
Ash'iknu (S.), To live.
Ashi-maga-wa, Backwards (Pfz.).
Ashin, To go out; begin; Ashin no, in the beginning.
Ashin, 新 New.
Ashini, A funeral feast.
Ashin-ke, To begin (Kl.).
Ashinno, In the beginning; for first time; ..... tan nishipa ashinno nukara shite, I have seen this gentleman for the first time.
Ashino bikata, A sheep or goat; v. Kokobu.
Ashinru, Water closet.
Ashipa, Deaf; v. As'pee.
Ashipa-etunap, Kind of ant (S.).
Ashipi-kiji (Ashipi-tek) Finger.
Ashipiki sotke, To pout.
Ashir-an-be, News, (Pfz.).
Ashire, New; Ashire shake (S.), new wine; Ashire pa, the new year; Ashire ek, ... comes (S.),=spring.
Ashiri hike, 嫁 To marry (a husband).
Ashitapa (Kl.), An oar.
Ashito map', Fierce? (S.).
Ashiui, Once.
Ashiyuru, 号令, (gorei) The word of command.
Ashke chuypp, First decade of the month.
Ashkibet'kiná, Kind of plant with flowers like fingers.
Asimi, Tomb.
Ásini, Grave, monument (Sch.).
Asis-chupp, w. Pon-chupp, Half moon.
Aske, To braid.
Askibets, Finger.
Asneppu, An oar.
As'pee, Deaf.
Ass', To stand up, v. Hoshike.
Ass', To fall (rain), v. Ash, and Hash.
Asseriki, Admiration.
At', The elm-tree (Ulmus montana).
Ataye, Price (Jap. atai).
Ataye hanke, Cheap.
Ataye kara, To spend.
Ataye nuppuru (? naburi) Dear (high in price).
Ataye yukki, Expensive.
Ate, To hang.
Atem, 傍 The side of.
Athap, An article of food.
Atim, Short; opp. to Shinetim, long.
Atkochi, A tail.
At ni (Jap. ai yō).
Atoi nare or Atoinne.
Atosa', (Atsusa), Naked (S.).
Atoshashe'epp, Slug?.

Ats', To hit (Jap. Ataru).
Atsush' (S.), A coarse cloth (or atu).
Atsush' a-i-o, The ornamental embroidering on clothes.
Atsute, To send; to cause to meet.
Att', Flying squirrel? Ak't'?
Atte, To use.
Attos', Garments made of the fibre of elm-bark.
Atui, The sea; Atui koru, to cross the sea.
Atui-kamoi, Sea-god; Neptune.
Atui kashita kayako, Sea-going.
Atui-no-to-an (S.), Smooth sea; Atui-pon, low tide out.
Atui rōko, Sea stone (? amber).
Atui-run-chip (S.), Sea boat.
Atui-shirano, The sea is calm.
Atu na o rera 北子 Horary char.
Atu sukarabi, A loom.
Atu ye tomo tuye, To go away.
Au, Tongue (D.) (prob.=Hauwe, voice.)
Aun rashambe, The horned owl; (S.) le Grand Duc.
Auta (Jap. tonari), Neighbour.
Awa (var. aba), Relations.
Awa-an, To sit, v. Kurum'shika.
Awame chkapp', Sparrow, v. Amama.
Ayakina, 文席 Decorated mats used in ceremonies.
Ayayam'ru, 糖 Sugar?.
Ayeshi yuru, 幽生 (yiu sei).
Ayushi ni, 山桐 (sen).
Azá, Uncle, mat. or pat. side (oheim, Sch.)? Acha ef, Jap. oji, v. Achabo.

B. *(v. under P.)*

Ba or Pa, A year; Ef bai, to go.
Ba, (Krafto) Smoke.
Babashi, (S.) Upper lip, (S.)
Badoi, Lip (lower), (S.).
Bagambe kutara, Palm tree.
Bagesaru, Prone, head first.
Bai, To go (Db. Mos.).
Baigara, Spring (of year).
Baikai, To go here and there (Db.); to trade 往來.
Bakari (Jap. Hakari), To measure.
Bake, The head (Db.).
Bakekiyo, Nightingale (Db. Mos.).
Banjo, Carpenter (S.)
Banake, Down the river (Db.).
Banake ma, Down the river.
Barakara, Bitter.
Barakeu, A jay (Db.).
Baraki, A fly (Jap. Dani), (Db.).
Barawari (Ish) Instep? tongue.
Baro, Month (S.).
Barokina, A plant eaten by bears.
Barumbe, Tongue (Kl.) (S.)
Barunum, To kiss (B.).
Bas'bas', Ashes charcoal (B.).
Bas chip, Heavy boat (laden).
Base orushipi, Important news (B.)
Baskuro (Bashi kuro), A crow (Jap. karasu) (S.).
Basna, Dust made by working firesticks.
Bayashak, Stupid (Kl.).
Be, Thing (Jap. mono) (water, Db.).
Bebe-o, Large flat fish.
Bekere, A light (S.).
Bekere-chupp', The sun (Db.).
Bekere pikata.
Be-ma, In the water (Db.)
Be-ma-va, Who is in the water? (Db.)
Beni, The rain (Db.).
Benake, Up the river.
Benram, A chest.
Berabasui, A small spoon.

Beriba, To cleave, split (B.).
Beringe, Sticky.
Beroki, Herrings (nishin).
Beruba, Smoke or smite.
Be-seushi or Beshoshi, Sleet (Jap. mizore).
Beta, To untie (B.).
Betame, Fork of a river.
Bet-e-etoko, Source of a river (Pfz.),
Betne, Moisture.
Betne-ka, To make wet; moisten.
Bets (Bet', Pet', Pech'), A river (S.).
Bets-chya, Bank of a river.
Bets chyamu, Side of the river; var. Bets-shama, and Bets-shamaketa.
Bets-chyō (river-bird), Stork.
Bets-e-itok, Source of a river.
Bets futa, Over the river.
Bets-kashiu-shama (Pfz.), opp. bank of a river; var. Bets kushita.
Bets-oshiyoro, Bottom of a river, or angle of a bay.
Betsu no ka, The milky way.
Beturura, Steam.
Be-urep', A kind of bear.
Bi-e, Fat; corpulent (Pfz.).
Bikada, South on the compass.
Biko, A bullock (Jap. beko).
Bi-ni, The ash tree.
Binne, Pref. to male animals of some kinds.
Binne-chironepp, Male fox.
Bira, Broad (S.), Den.
Birashi-wa, To open (S.).
Bitara, The neighborhood of a river (Pfz.), Ms. Sayō, shore 濱邊.
Bitasa tsepp, Fresh fish, (Pfz.)
Biuzi, Tinder (Sch).
Biyapa, Millet (S.).
Biye, Seed.
Bogi (vagina), Female; opp. to Chii, male.
Boho, Son.
Boki, Fem. parts; (Db.) Pudendum muliebre.
Bokna, Under; below (B.).
Bokna moshiri, Hades (B.).
Bokochakida mada ahup kara, To betroth while young.
Bokunashi, Hell.
Bokunashi-ne-ran, To descend into hell.
Bone (Pone), Bone.
Bone-its, Dist. betn. 1st and 2nd joint of first finger, for measurement.
Bopu, To bubble, seethe (Pfz.).
Bopu an be, Boiled thing (Pfz.).
Bopu rai-ke, To sweat.
Bopu rai-ke hetoku, To produce sweat.
Boso, To admit (rain.); v. Oboso, to make a hole.
Bukara, pl.
Buki, Bellows.
Buku sh'iya kina, A kind of plant, which is eaten. V. 18.
Bungara, The vine.
Bunki, To watch, guard (U.) Den.
Bunma, Rice (uncooked).
Buri or Puri, Very (B.).
Buri (Jap.), Manner, kind, nature (B.).
Bushi ne wa hott, 1,000.
Buto, (for Be-u-to), Going to the river.
Butta, All (obitta).

C.

Cha, To be strewn (v. Chari).
Cha (S.), (or Tsa), Branch or sprig or spray.
Cha cha, To saw, v. Shi che-cha.
Cha-cha, Familiar for "old man"
Cha hau ke, Strewn.
(Dx.), grandfather (Kl.).
Chak'chak' (S.), Small bird like a wren.

Chakkeri, Deity.
Chakki, To open (Kr. Den.).
Chaku, Autumn, (prop. Chōk S.).
Chapu (Shaba), The head.
Chapu keri, Dirty.
Charaku (K.), A light.
Charange, To judge (B.).
Chari, To strew over (v. Cha).
Charō, Mouth; v. Barō.
Charum (var. Charō), The mouth; cf. Barō.
Chas', An enclosure, city.
Chas' karu, To build a city.
Chashi, A fence, cf. Chas'.
Cha-shiu, Tea kettle.
Chaza, Old (prob. Chacha, q.v.).
Che-kidai, Roof of house (Sch.). (Che is contr. for Chisei).
Chep, v. Tsepp', Fish.
Chepp', A boat; Chipp' guru.
Chepp' (Chepp or Tsepp'), Fish.
Chepp chiporo, Fish spawn.
Chepp hema, Fish roe.
Chepp' koike, To catch fish; — Sat' ke (Shat' ke), To dry fish.
Chepp ya etai, To take fish.
Chepu-ri, Fish; spawn.
Chi, An old man (S. Den.).
Chi, To cook (S.), (Tsi.), Chi amam', cooked rice; Chi chepp, (S.), cooked fish.
Chiai, A cork, a stopper (B.).
Chi-e-ne-nube, Cushion; pillow.
Chii, Male children; (Chiye, penis B.).
Chi ji kap' (? Chi chkapp'), A hawk.
Chike ne-wa, If; (cf. chiki,=when (cf. Ger. wenn if.) Ah! certainly (B.).
Chiki, Then; at the time; when.
Chiki kip, Animal (B.).
Chiki na, To blow, v. Uku.
Chi kinane, The foot.
Chiki rasam, Under the foot.
Chikir askm, Sole of the foot.
Chikiri (S.), The leg of a dog, perhaps of any animal.
Chikisa-ni, or Chi ki sha ni, The Elm (akadama) (S.).
Chiki sap', To steal.
Chikoi kipa, Kind of water rat.
Chikoro, Ours (B.).
Chikoro kotan shiri-shimoi isham, There are no earthquakes in our country.
Chikots, Ours (Pfz.) (S. or Kr.).
Chik'u baba (S.K.), Black beetle.
Chikuni, Tree (S.) (U.).
Chikuni 回 徑 Circuitous route.
Chikuni ham, Leaves.
Chikuni k'ashita, In the top of a tree.
Chikuni shat'ke, Dried tree.
Chikuni shen rik, Root; the wood is dry.
Chikuni tek, Branches.
Chikuni zueruru, Trunk of tree.
Chikupap, (S.), Stag-beetle.
Chi ma gu ni, Clothes.
Chimi (S.), The post on which the fibre for weaving is fastened.
Chimip, Articles of clothing.
Chinana, Dried fish in store.
Chini, To wither; dead wood (B.).
Chinita, A dream; nightmare (B.).
Chinita an, To rave in sleep.
Chinken (K.), Root of a tree.
Chioki-chepp, (S.), To sell fish in quantities (wholesale).
Chip' chip, To seek for.
Chiperi bane (S.), Fuel.
Chipiak, A snipe (B.).
Chipiaku (S.), A large snipe.
Chipo (S.), An oar.
Chipo-wa, As he rows.
Chipp'-aro ashin, To go ashore.
Chipp i-yak, Woodcock; v. chipiak.

Chipp iyangi, To haul up a boat on shore, (Chipp yan, B.).
Chipp' orun, To go aboard.
Chipp' yan.
Chirachi chikerep, A saucepan, or pot.
Chira mantep (S.), Tsura mantep, Bears, gen. name f. Kuchan, m. Shiyuk.
Chirai, Thread.
Chira mantep, Animals; wild beasts in general.
Chiramantep opa ni otke, To spear the bear with a spear.
Chiri, Generic for birds (small).
Chiri koike, Hawk (?).
Chiri ushi, Broad.
Chiro-bogi, Foot of mountain.
Chironup (S.), A fox (K. S, U.).
Chiroshi nei be, Kind of fish, v. VI. 9.
Chirunipp' kamoi, The Lightning and Fox god.
Chirup chup, January (B.).
Chisari, To burst.
Chĭséi, A house.
Chĭséi dai, A village.
Chĭséi kashigi, Inside of roof (Den.).
Chĭséi kidai (kataj (S.) Roof.
Chĭséi koro guru, A householder; husband (Dg.).
Chĭséi ne-mun', Cultivated plants (Pf.).
Chĭséi otta hoshibi, I go home.
Chĭséi un, In the house.
Chĭséi un ahun, Enter a house.
Chĭséi un ahupte (B.), To bring in doors (B.).
Chĭséi yai yetoku oiki, To prepare a house.
Chiseparaka (K.), Roof; outside.
Chish' (U. S.), To cry.
Chishi (S.), To weep (Sheshiriki).
Chislin (S.), One's home.
Chitose take, N. of place; of a mountain.
Chiu mari, Fox (S.), syn. of Chironup.
Chiuri? Large cockle (S.).
Chiwente (K.), To be in pain.
Chkapp', Birds (large).
Chkapp' hirishiki, Full of birds, plenty of birds.
Chkapp' hobuni, Birds fly.
Chkapp' koi-ke, To catch birds.
Chkapp' oïshi, Tail of a bird.
Chkapp' opaï-o, Tail of a bird.
Chkapp' rapp-poronno, Bird's feathers.
Chkapp' to kan, Two birds.
Chkasei, A nest (D.); Chka-se-i, bird-dwelling.
Chōk', The autumn (S.), Shi-chōk'.
Chōkai, I, pers. pron.
Chōkai-koro-be, (sm. as Ku korobe), My property.
Chōkai napun no wakka iku, I will drink water presently.
Chōkai-ōtta, To me, towards me.
Chōkai ōtta enikōre, Give me, if you please.
Chōkai-utare, We.
Chōkai wakka iku, I drink water, ugu.
Chōkai-zakata, I myself.
Choro-baki, The floor.
Choro-bogi, Beneath the window.
Choropokikke, Under; Toitoi choro-pakikke, under the earth.
Chosh cha, To shoot with a bow.
Chot-sa, To shoot (bears, etc.).
Chuku-un-pa, The autumn of the year.
Chupp', The sun.
Chupp abe patek, The sun is fire only.
Chupp' afunno wa homaka, The sun goes down.
Chupp' ahun, The sun sets.
Chupp' ahun ma isham, The sun has not yet set.

Chupp alion (S.), A star.
Chupp anakú ne kamoi, The sun is not God.
Chupp ishi, Every month.
Chupp' ka (ascend), East, Pfz.
Chupp' kamoi, The Sun-god.
Chupp' ke, A shadow (?) Pfz.
Chupp' ke-ai, Rays of the sun.
Chupp' kes, Burning out of evening (?).
Chupp' nube-an, Star (?).
Chupp' pe toko o ashi, Sunrise (S.).
Chupp' pok (descend), West, (Pfz).
Chupp' tek-ta ek, (about 7 a.m.) (?) (S.).
Chupp' ran, Sunset; 7th hour of evening.
Chü rupp', 12th month.
Chutti, Clubs of wood (Sieb.), the same as Shutti (S.).

D.

Daidanne, February.
Daike (Taike), Flea.
Dan, Above.
Dasun, Disease (v. Ikoni).
Deda (Teta), Here.
Deda ariki, Come here; Teta ariki or Teta ek (S.).
Deida, Ancient.
Dem, A mile.
Den, A stretch, arm's length.
Deni boku nashi, Second hell.
Deni kando, Second heaven.
Denna, Small adze to scoop out boats.
Denwa, Fern, eaten by Ainos.
Deriki (Teriki), To jump.
Desuma-ni, Mulberry tree.
Dō (Tō), A woman's breast.
Do (To), Noon.
Dogeshi, Afternoon.
Doi, Earth; soil ± cf., Toi, Tōi-toi.
Doi-da, Garden.
Doi-moku, A worm.
Doku kone, A snake.
Dōkushi, A fish (v. mashu).
Doku shishi, A fish said to cause earthquakes.
Domi, War-fight; war.
Do-mon, Nipple.
Donkori, Musical instr. stringed like the samisen.
Do-non, To suck.
Doshiri (Toi-shiri), Grave.
Doye, To cut, saw, strike (with sword).
Dre (Rei), Name.
Drek (Rek), Bear.
Drehe (Reihe), Meaning.
Drui (Rui) tosh', Large rope (S.).
Drushi (S), Bear skin dried.
Dukkono-kamoi, The snake god.
Durek, To lead.
Durip (for Turepp. the mulberry), Lilium cordatum, juice of which is good for consumption.
Dusuniga, Squirrels.
Duwa, cf. desuma-ni, and denwa.
Dzeiwange, Implements.

E.

E, You, pref.=that one.
Eakk' (Den) v. akk', To shoot (U.).
Eäni (S.), You; opp. ku-anito, I.
Ebara (Den.), To blow (S.).
Ebera or Ebira hungry (Db.).
Eberushui, Hungry.
Ebi, To eat.
Ebuike (S.), Fruit.
Ebuiki, Flower; (Ibui).
Ebunki ni (S.), Take care!

Echi (S.), You.
Echinge-heporap (S.), Swallow-tailed butterfly.
Echinke, A tortoise (S.).
Echiya, An oar (Kr.)
Edoide amam, Millet, or rice; to sow.
E-en, Sharp (S.) opp. E-nokara, dull.
Ehan, To oppose (Kr.)
Ehomushi, To tie.
Ehu koshi (S.), To descend a mountain.
Ek', To come, v. Ariki, Arapa.
Ekam, To defeat.
Ekara, To get.
Ekashi, Grandmother (K.).
Ekashi, Uncertain.
Ekatai, Curious; Ikatai! Ikatai! on seeing for the first time.
Eken, A hill (S.).
Ekitari, You (Pl.).
Ekoba, Mistake (v. Ikoba).
Ekoka, You.
Ekon ruye, To have.
Ekor'kotan ōttá ókai-wambe an drufe an, Are there ten men in your village? (Sch.).
Ekoro, Your; — achabo, your father; onakta arapa, gone where?
Ekumbap, Caterpillar (S.).
Ekuroko, Black.
Emanda or kuerambe te ek, To ask.
Emauri, Irillium Sp. blackberries, used for food.
Embi (S.), Finger.
Emkoto (A. noon.) Soon.
Emontabiri, Careless; (S.) busy.
Emrui, (Jap. osou), To storm, attack.
Emushi (U.), A sword; — emus rimise, (Sch.), sword dance.
Emushi at, Sash for a sword.
Emushi-nip, Haft or handle of a sword.
Emushi-pe, Blade of a sword.
Emushi-shirika, Sheath of a sword.
En, p.p., Me (S.).
Enebakashnu, To teach (S.).
Enedarara, Anger.
Enedarara un sokeri, To become angry.
Enerusha (S.), To borrow, hire (boat).
Engaru, To see.
Engokandama (S.), To deceive.
Engoram guru, Agreement.
Enisokorite (S.), To borrow.
Enkore, (Jap. kureru) To give, present.
Enköri, To give (Jap. kudasare).
Entō kamoi, 公議 kōgyi. ? the Shōgun.
Entokori, A priest (D.); Etoikuru (S.).
Entüra, To follow, accompany.
Enukara, Dull (S.).
Enum-noya (S.), A small bird like a titmouse.
Eodekara, To beg, ask (K.).
Eo dzatte, To praise, command.
Eo gu, To touch (S.).
Eomashinu (U.), All.
E-o-ya, Did you take? Chipp e-o-ya, Did you take the boat.
Epautenki (J.), To command.
Epechi, To stumble.
Epet'ke-ibe, Cuttle fish (?) (S.).
Epikiri (v. Bekere), Light.
Epirá, Hunger Db.
Epotara (S.), Sad, (shimpei) anxious.
Eppakashinu (K.), To learn, v. Enebakashinu.
Eppuriki, (U.) Leaf of a tree.
Eraman (S.), To know, remember.
Eraman-o-ya (S.), Do you know?
Eregus (S.), Erekoshi, A codfish.
Eri-kasu, Codfish.
Erimu, A rat, mouse.
Erum, A rat; — koike, to catch a rat.
Esa ureri an, To forgive, allow.
Eshaman (S.), River otter.
Eshin, Before (cf. ashin).
Eshina, Esuna, To sneeze; eshna (S.).

Eshingurare, To hold.
Eshi-riku, To throw down.
Eshokshō'ki, A woodpecker.
Esse an, To consent.
Etara (cf. Jap. ataru) To hit.
Etarashi (K.), To stand up.
Etashippi (S.), To do.
Etei, To draw a sword.
Etoe púni, heaped up (of rice in the measure) (S.).
Etoi-kuru, A priest (bonze).
Etoi-ta, To sow (seed), (U.).
Etokota (U.), Before (used for forenoon).
Eton napu, An ant.
Etop (U.), Hair.
Etori, Mucus from the nose.
Etori rap'-ki pu, Polygonatum Sp.
Etoro, To snore (Jap. ibiki).
Etsuki (S.), Do not.
Etu, (Edu) Nose.
Etufu (S.), Nose of a dog.
Etu kemu, Blood from the nose.
Etuki kamu shipe, Bill of a bird.
Etuku (S.), To be born, v. Hetuku.
Etuku-su, The beak of a bird.
Etun, To trust.
Etunap, Ant, (G.).
Etu nupp', A cup with a spout for wine.
Etu piriba, To wipe the nose.
Eturu baku summiki, To disagree.
Eturu baku tamau, To agree on.
Etutani, Mosquito ; Etutan' (S.) Etutara (U.).
Euniga, To hurt, pain.
Ewaji, To lose, drop.
Ewange, To send.
Ewanke che-i-kipp, (S.), A carpenter's plane.
Ewauze, To use.
Eyai kapu, Unable, v. Aikappu.
Eyai ko-pun tek, (S.), Very glad indeed.
Eyami, A jay (S.).
Eyami rapp, (S.), A jay's wings.
Eyasukai, Able.
Eyayashi ka-iri, (S.), To learn.
Eyo, To sell.
Ezo, Island, Matsumai (Kr. Db.).

F.

Fara (Kl.), A lance, spear.
Fosei, To whistle.
Fu (nama), Unripe, fresh.
Fu amam' (kome), Uncooked rice.
Fuaman, ※ Raw rice.
Fuchi (H.), An old woman.
Fuibe, Liver (Leber, Sch.).
Fumbe, Whale.
Fumbe de tsep, (Jap. sayori,) (Den. S.)? Fish smoked.
Fumbe reki, Beard of the humbe, whalebone.
Fumi, Noise, sound.
Fumi an, To creak.
Fumi ushi, To shake.
Funara (Den.), (S.), To search for anything.
Funara ashikai, To find.
Funata, To find.
Fúp (pr. foop), To swell, (cf. fumbe), whale.
Furai, To wash (U.S.K.).
Furaki, Rotten.
Furakoro, Having a stinking smell.
Furano, (Kl.) To stink.
Fura-uen, A bad smell.
Fure, Red.
Fure ambi, Red ink.
Fure gani, (kane) Copper.
Furepp, Name for a bear.

Fure-un in ? Purple.
Furi, (H.) Step.
Furu, (H.) Mountain.
Fushiko, Old.
Fushiko shake, Old wine (S.).
Fuyungo, Bellows.
Fuzi, (Kl.) An old woman; Fuchi, (H.).
Fuzy ni, (Kl.), Narrow.

G.

Ga, (S.), Even.
Ganuma, (U.), The eyebrows; Ranuma.
Garonjikap, (K.), A duck; v. Chkapp.
Garushi, (K.), Mushroom (on trees, toi-toi karushi), ground mushrooms; pero karushi, fr. the (naru noki) (Jap. shi take).
Gei gi, Swan.
Giku, (v. kik') To beat, strike.
Giroro, Strength.
Gisatura, The ear-wax, S. kishara onmai.
Gōyamokte, (S.), Funny; entertaining.
Gū, A bow, or *ū* (kuu, and kfu).
Gu ani choshcha wa raike, To kill by shooting with the bow.
Guchiya or Gucha, A house.
Guhijiri, To fall into.
Gui-doku, Wild goose (Saru man says *Guito*.
Gū-ka, String of a bow (Kl.).
Gukatai, Cunning.
Gushi (Jap. 筈 hazu) The notch of an arrow.
Gushima, To nurse.
Gusu, Because, as.
Gutu, (v. Kut'), Woman's belt.
Guwanno, Straight.

H.

Ha a riri 氣, Air.
Ha-a-ure, The thigh.
Haba-chiri, Eagle.
Habdrub-chup, 2nd month.
Habo, (or Hapa) (S.), (S.U.) Mother.
Haburu, Soft (K.).
Háchiri, To fall, (U.), Háchir (S.), the *ri* is nearly dropped.
Haguye, The navel.
Hăhă, A climbing plant, roots like beans, eaten by the Ainos.
Hai, The nettle,—string.
Haida, To mix.
Hai kăra, Nettle stings.
Hakka, Hat.
Hakodate un, To Hakodate (S.).
Hambe, Father.
Hamtai chup, 6th month.
Hamŭ, Leaf of a tree (S.).
Han, (U.), To neigh, winnow.
Hange, (S.), Cheap.
Hangi-no, or Hange, Near.
Hangi no ariki, Come near.
Hango (S.), A dragon fly.
Hango-chochă, A dragon fly (S.).
Hankara, (or Pankara) A heavy axe.
Hanke, So; Hanke ne, it is so, yes.
Hanke-chup, 12th month.
Háp hăp, (S.), Thanks! (H.).
Happura, (U.K.) Weak, soft.
Happuri ari, Large teeth.
Haprapu, March.
Haram, Newt (S.), Because it jumps.
Hariki, Fuel.
Hari-kiga, (K.), A rope.
Harikishima, The left.
Hariki-tek, Left hand.
Haru, Food.
Hash', To fall (rain), (e.g.) Nishatta apto hash', it will rain to-morrow.

Hat' pungara, Grape-vine, *vitis cordifolia*.
Hatu, A grape (hats).
Hau, To neigh (S.).
Hau-e, A voice, (H. Kr.).
Hau-e ashi, Hum of a wasp.
Hau-e ashin koyaku su, Hoarse voice Dx.
Hau-e shan-ke-wa, To raise the voice; to scream.
Hauke, Quiet.
Hauke guru, Weak man.
Hauke no, Gentle, weak (S.).
Hausaka, To be quiet.
Hawe ashi, To sing.
Hawe ashite, (S.), Voice.
Hawe rui, loud voice.
Hawe-sank'e, To croak (K.).
Hayokupp', Armour (Jap. yoroi).
He, Sign of mas. gender (S.).
He-banke, Near; v. Hange.
Hebeu, Flat fish.
Hebu dudu, Bud., depressed (B.).
He cha wé ni, Trigger of a gun.
He chawe ni, The support in bear trap; (S.), a cross of wood ×.
Hechi rasha, To bloom? echirarahi, cf. birasha.
He chiri, Aino dance; to play (D.N.) (K.).
Hechuri shishyam, An actor, (K.).
He dan, Here.
He doku, To rise (as the sun).
He-eshi, Narrow-minded.
Hehai, Old.
Hehoku shaku menoko, An unmarried woman.
Hei shi, To breathe (S.).
Hekachi (S. U.), Child, boy.
Hekachi ramguru, Childish, boyish.
Hekai, Adult.
Hema, You, pronominal prefix (S.).
Hemaka, Finished.
Hemanda? What? (S.).
Hemanda e kashiu (K.), What are you doing?
Hemanda ta, What do you say?
Hemanda ta kushiu arigi, Why have you come?
Hemasho,=(v. Heri kashi ra).
Hembak', How many?
Hembano, Shiriba na, good morning.
Hembano, How much (Dx.).
Hembara, When, once.
Hembara (S.), Where?
Hembara e ëki (S.), When will you return?
Hembara-e-oshipit', When do you return?
Hembara náka (Kl.) Ever, always.
Hembara nara, Always.
Hembara ni yakka, Commonly.
Hen, In compounds=what.
Hen an ta, By what?
Hen bakko-no-yakka, Whatever it may be.
Henki, Father (K.).
Henne, Not is, wrong; (非 Arazu).
He-o, To come to the surface of the water (of fishes).
He-oshi-nen, The breathing holes are bad.
Heperi, Bear's cub (U.); Isho (Kr.).
Hepetáne an ka, Bent stick in a trap, (S.).
Hepita, An elastic spring, or to spring back (S.).
Heporapu, Butterfly (swallow-tailed).
Hera, Weaving, or the instrument of —.
Hera (or Bera), Spoon.
Heraku, Lame (U.).
Herekashi ru, Steps up a mountain (S.), or to a temple.
He-riatsu (S.), Light, bright, brilliant.

Heri-heri-ki, To scold (Dx.).
Heron guru, Poor man.
Heruki, A herring (S.).
Hesam hetokoshi, To pass away.
Hese, Breath.
Hese mane, To breâthe.
Heshi-heshi, To pant (with running).
Heshiru-utare, A diviner.
Hetuku, To grow; to live; be born.
He-uke, Crooked.
Hikata (S.), South.
Himaisho (U.), Going up a mountain.
Hinakoi (S.), Where? var. Hikara.
Hinako-ni-arapa (S.), Where are you going; Fu na kun e arapa.
Hinuye, To carve, (tatoo marks.)
Hira, A bank.
Hirashaba guru, A bald-headed man.
Hiratori kotan (Biratori?) N. of a great Aino centre, the head quarters of the Ainos.
Hire kunni (S.), To set, (as the sun.)
Hirep kurot (S.), Dark.
Hiruafui (Ahui), A conflagration.
Hishi yai, To sleep; Hishiyui (Mats. M.S.).
Hishite, Sea-shore (Pishita), (S.).
Hitruji (S.), A fearsome beast w. Ainos.
Hobunba, To get up (S.).
Hobuni, To rise up (忠 立), to wake up, to set out.
Hoisuni, Foam, froth.
Hokam'ba, Difficult? clever?
Hokamba (S.), Different.
Hoku (hok') To buy (v. Ehok) (S.).
Hoku (Hoku ho) Husband (U.).
Hoku koro wa, To marry, married (of the woman).
Hokuyuku (Pfz.), Bear; Binne hokuyuku, male ——; mat'ne hoku-yuku, female ——.
Homa, Roe of the herring (nishin).
Homakano, To go away.
Homa kuropi, (U.) N. of bird (Jap. hajiro).
Hombiri, To grumble.
Homeriu, Grouse (S.); (Humeroi (S.), partridge.
Homeru, Humpbacked.
Homi (S.), The leg.
Homi, A knot.
Hon gan, King, governor.
Honi, The belly, (Pfz.)
Honoïshe (S.), To growl, snarl (of dog) (S.).
Honoyekina (S.), Epirus Palmata.
Hontomo, A half, (Pfz.)
Hop'ne, Narrow.
Hopuni, To get up early; to fly.
Hopuni oman, To go flying.
Horak chikuni, Name of a tree.
Horaku, To fall down, tumble down.
Hori, Above.
Horipa, To dance.
Horo (S.), Time, when.
Horoka (S.), Genus cray-fish.
Horokadreyep, A lobster (S.).
Horokara-yepp, A sea cray-fish (S.).
Horokoshibi, Backwards.
Horokui, A wolf; Horokiu (S.).
Hoshibi 返, To return.
Hoshi kaap'ne (U.), Year before last.
Hoshi ki (hos'ki), Before.
Hoshiki deni, Veratrum album.
Hoshi ki no arapa, Walking before.
Hoshi ki arapa rushiu, Wishing to go first in (races).
Hoshi ki numan-ni, Day before yesterday.
Hoshi ki oman, Go or walk before.
Hoshi kit'pon no hoshi kit (S.), To wait a little.
Hoshiki ukuran, last night.
Hoshipi, To return (K.).

Hoshippa, To dwell.
Hos'ke (伐), To lie in bed with eyes open.
Hotanu, To press.
Hot'ke, To lie down.
Hot-ke-an, To lie down (S.).
Hot'ku, The back.
Hotku tapkara (S.), Raising the hands in dancing.
Hotoshika (Dx.), Bag.
Hotsiba, To call.
Hott! Interject. of surprise.
Hott', 20 (S.).
Hōtū (K), Lame.
Hoyubu, To run (K).
Hoyubu, (pu) To run (S.).
Hu, Ran, past tense of run (S.).
Humbe (v. Fumbe), A whale.
Humi (or Fumi), Sound.
Hunara (funara), To ask, question.
Hupu (S.), K. of pine (toto matsu).
Huyupu (S.), To run away (v. hoyubu).

I.

I, pron. prefix, To refer the action or thing to another.
I or Iam, You.
Iada, A hanging bank (Dv.).
Iba-kashi (S.), To teach, or instruction.
Iba kashinu guru, Learned man.
Iba kashinu kuru, To teach.
Iba-u-tenki, The command (S.).
Ibe, To eat.
Ibe, The kernel of stone fruit (walnut, ninum ibe).
Ibe, Pungent, nice.
Ibe an, To be nice (S).
Ibe an be, Provisions in store, rice, etc.
Ibe kuku, Flame? Abe-kuku.
Ibe kuyak isham, Could not eat.
Ibe ri, To give to eat.
Iberu, To cause to eat.
Ibe yakka, While eating.
Ibirori (Jap. buto), A poisonous fly.
Iboho (U.), Your child.
Ibui, Grass.
Ibuigi, A bud, flower.
Ibuigi birashi, To bud.
Ibuike, A flower.
Ichagasno, Teacher.
Ichakashnu (K.), To teach, explain.
Ichak'kiri (U.), Dirty (S.).
Ichanui, Salmon trout (S.).
Ichi kore, 遣.
Ichishike, Crab.
Ichōkai, You (polite).
Idankai, A kind of berry (Dx.).
Idaru pirika (Kr.), Level or flat.
I-e-tu-nankari, To go to meet.
Igurush, Thirsty.
Ihok', To buy (U.).
Ihoshiki, (U.S.), Drunk.
Ijokpe (S.), A sickle.
Ika, If, 若.
Ikanashi, 辰.
Ikane-beka, Must, 必.
Ikarakara (U.), To make anything.
Ikarari, Violet colour.
Ikari, From, 自.
Ikarpupa, Talisman.
Ikashi (S.), Plus, more.
Ikashi, Great-grandfather.
Ikashima, Much, overplus.
Ikashu, Assistant.
Ikasui, To help.
Ika-un, To increase.
Ikayop' (S.) (Kl.), Quiver 矢筒.
Ikdre (Ikre) (S.), Joints.
Ike, Then.
Ike (Jap. toki ni), Then 于時
Ikeba, A mistake.
Ikenno, An enemy.

Ikerere-uge, Stooping.
Ike-u-ei (Ikewei) (S.), Backbone, vertebræ.
Ikidara, A kind of bamboo.
Ikiri, The seam.
Ikiri nasha, To rip up the seam.
Ikishakani, A borer (carpent. tool).
Ikishyani chep (Kr.) K. of fish.
Iki-ya-an, Who, where?
Ikkakura (U.), To steal.
Ikke (S.), A joint.
Ikke-u, Backbone.
Ikohonoye, Punishment.
Ikoni, Disease.
Ikoni ushi wa, Much sickness.
Ikoram guru, To ask for, to beg.
Ikoro, Precious thing (Aino used for money, small dagger).
Ikoro chacha, Venerable old man.
Ikoshita, There (U.S.).
Ikoshunke, 僞, False.
Iku, To drink (Igu) (U.S.K.).
Iku-bashui, A wine stick.
Ikukebi, The backbone.
Ikukuku, Thief.
Ikuma-ura, To belch.
Ikunau, To stand.
Ikure, (ri) To give to drink.
Iku shamoki, Does not drink (S.).
Ikush'be, A post.
Ikushippi, A pot.
Ikushita, There, yonder.
Ikushita oman (Sch), Go away.
Ikushunke (U.), To receive.
Imakake, After that.
Imakeke, 後其, After this.
Imaki, Teeth.
Imá-tchep, Roasted fish.
Imashiu, 倦 Tired, fatigued.
Ima-uri, Blackberry.
Ima-uri ai-ush'ne, blackberry bush.
Imeru, Lightning (S.).
Imi, Clothing, cf. Ami.
Imi karu, To make.
Imi-mii (S.), To put on clothes.
Impak'? How many; v. Pak'no, to, unto.
Impak'pa v. Hembak'pa? How old are you? (S.).
Imush, A sword; v. Emushi.
Inam, Which.
Inambe, Which thing.
Inan, What.
Inan garapte, (K.), How?
Inan niyakka, Whatever.
Inao, Whittled sticks to represent prayers.
Inao kiki, Several curled shavings to consecrate places (kami dana, etc.).
Ine-an-be, What kind of thing?
Ine-chikiri-ush-pa, A quadruped.
Ine sombanum, Square.
Ingarabobo, Pupil of the eye.
Ini, Four men.
Inikishite isham, Without mistake.
Inin, A woman who had four children.
Inishi, Little fishing net, (Dv.).
Inkari, To look.
Inomi-chup, 1st month.
Inono, Prayer.
Inoshine, Acanthus? ....
Inumbi (S.), Edge or framework of the fire-place, (Jap. irori).
Inuye, To carve (wood etc.).
Iopke, Sickle, (Kama) (S.)
Iotani, A pestle.
Iraman, To know.
Iramande, To hunt.
Iramboturare, Noisy.
Iramu fukuro (?) To obey, (Dx.).
Iranga at, Rewards.
Irangarapte, How do you do?
Iri wake, Brethren, same as Iri waki, (imoto), younger sister, cousin, friend.

Iro, Lustre.
Irō, You.
Irronne, Thick, stout.
Irushka, (Kr. Kl.), To affront; offended (S.), cf. Itaki, also, in Klaproth, angry.
Irushuika na, Angry.
Isaigu, Easy.
Isam (Isham), Is not (Jap. nashi).
Ishidoma, Afraid, v. Shitoma.
Ishiki an guru, Each person.
Ishin ne no, Together with 共.
Ishi yamani (or Ishyamani), Otter.
Ishiyo-itaki, To say.
Ishneka, Phantom (Dx.).
Isho, The young bear at Tsuishikari.
Isuka, To steal; Isuka guru, thief.
Ishorórika, To stumble, trip.
Itunapp' (S.), Ants (S.).
Ine hott', 80, (S.).
Inep ikashima, 14 (S.), Inep ikashima wámbe.
Inkara káni, Spectacles or telescope (S.).
Inononokara, Sad (Dx).
Inoyashi guru, A crazy fellow.
Inu, To hear.
Inua, Deaf.
Ippe-ambi (U.), An eatable thing.
Ippe-rusui (U.), To be hungry, better; Ibe rushui.
Iram ish guru, An ignorant man (Dx.).
Iram ish kari, Don't know (Dx.).
Iramki tarara, Noisy (S.).
Iram üsamka, To lead astray.
Iramu shikan, Not to know.
Iranako (K.), Noisy.
Irapp' (v. rapp'), Wings.
Ire, To give (food to animals).
Isakere, Dirty (K.S.).
Isheppo, A hare.
Itai, To draw out.
Itaki (Itaku), To speak, language.
Itaki, Cannot.
Itakube, Conversation.
Itakube yakka, While one speaks.
Itaku muma, To splutter.
Itangi, Aino bowl.
Itangi chup, 10th month.
Itanke, Key.
Itanke-kemba, Index finger; lit., key-finger.
Itashiya, To answer.
Itashi yashi, To be pained.
Iteke (bekarazu), Not to be, don't.
Iteke-ūk, Don't touch (S.).
Ite kiki, It is not.
Itekitá (S.), Elder sister.
Itoko, Origin.
Itomáki (a Jap. word), Thread-winder; a square piece of wood to wind thread on.
Itomamani, Starving.
Itomo buyara, The window of the upper seat.
Ito moto, To arrange, order.
Itu, Nose; Itu-betsi-ka, moisture from the nose.
Itu (cf. Etu), Nose; Itu bui, nostril.
Itunapp', Ants.
Itupp', Less than two.
Itutune, Doctor.
Iwadobi ni, Acer tartaricum.
Iwakube, To bury (Iwákte).
Iwambe, Six.
Iwambe ikashima, 16.=Wambe.
Iwanke, To use (U.K.).
Iwara, To blow.
Iware'wa, To blow, to cool anything.
Iwashi, Sardine.
Iwonni, To wash (S.).
Iwonni andi, To wash the face (of another).
Iyabi 惰. Indolent, remiss.

Iyai gipti (Jap. abunai), There is danger.
Iyai kip'te, (abunai), Take care!
Iyairaigire (S.), Thank you (Den.).
Iyanoi (S.), A salmon trout.
Iyatte, An ornament.
Iyohobota, Weak.
Iyokishambu, To mimic (Dx.).
Iyomari (S.), A vessel w. wh. to serve out wine; a lipped basin we should call a jug.
Iyomari menoko, The woman who bears about the wine cup.
Iyoshi wa araba, Come behind.
Iyowashi, Itch (v. Yowashi).
Iyurube (汁物 Jiu mono) Juice, drippings.
Iyuta, To pound in a mortar.
Iyuyagiri, Thank you!

J.

Jar' angu (Dx.), Skilful.
Jishubish', Bright yellow, chrome (Dx.).

K.

Ka (U. S.) And; (S) a reflexive prefix.
Ka, Thread.
Kaba chiri (S.), Vulture.
Kabapu, A weasel.
Kabocha (Jap.), A pumpkin.
Kabu hara, Shell of a nut.
Kadai (U.), Roof (cf. che-ki dai (Kr.).
Kagi, To scratch (Jap. kaki).
Kai, To break 折, to split.
Kaida, An anchor.
Kaita, Thick rope.
Kaji, To row (Jap.).
Kakeya (Jap. hammer) (Sch.).
Kaki, (Jap.) A fence.
Kakkumi, A ladle for water.
Kaku, Skin (of man).
Kam, Flesh (K.).
Káma (v. Pet-káma).
Kamba ushi (S), Moustache.
Kambi (K.), A letter; a book; (Jap. kami), paper.
Kambi kor kur, Law officers of justice.
Kambi no ye, To write (S).
Kambi-no-yep, A pencil, or pen (S.).
Kambi-shishamo, A writer.
Kami or Kaoni, From.
Kami-ashi, Serpent; snake (S.).
Kamoi, God 神 靈.
Kamoi chisei (U), A temple.
Kamoi fumi, Thunder.
Kamoi kot'chá wa (S), Before the gods.
Kamoi man, Stone god.
Kamoi ne beke, The divine radiance (for Bekere, q.v.).
Kamoi pungara, Shizoophragma, Hydrangioides (B.).
Kamoi-shet (J.), A bear's cage.
Kamoi yachi (U.), A ghost, a spirit.
Kamo kamo, Sort of hanging box.
Kamui-kur, Syphilis (Sch.).
Kamuiniya (komatta), Troubled (A. Won.), v. Yai yo serihe.
Kanashi (K.), Again; Kanashi arigi, Kan arigi, I come again.
Kanats, Girl.
Kanchi (H.), A shell? scull, rudder.
Kanchi, Part of shaft of an arrow (Kr.).
Kando (U. S.), Heaven; sky.
Kando ne riken, To ascend to heaven.
Kando orun pikin, To ascend to heaven.
Kando orowa ran, To descend from heaven (B.).
Kando yokke, Wild.
Kandum ukuboyeki, Foolish.
Kane, (Jap.) Metal.
Kane koro ka, But.

Kangan, Entrails.
Kangari, Gold.
Kanhu, (U.), An ordinary mountain (Den.).
Kani, p.p., I (S.), var. of Kuáni, "I."
Kanit, A shuttle.
Kanji, (Jap.) An oar.
Kankan, Bowels, intestines.
Kanna (Jap.) Mata 又), Again (S. U.).
Kanna karu, To make again, mend.
Kanna kamoi, Thunder god.
Kanna kamoi fumi wa, It thunders.
Kanna piri, Shavings of wood (S.).
Kanna shi arigi an (S.), He has not yet come.
Kanna shi ek' (U.), Come again.
Kapachi (S.), An eagle.
Kapapp' (S.), Bat.
Kapappa, Butterfly, cf., Hepurapp'.
Kapara, Thin (opp. to Ironne) (S.).
Kaparape, A circular box (S.).
Kapato, Name of plant; red flower (eaten), the tiger lily?
Kapiu, Sea-birds; sea gulls (S.).
Kapu fu, Skin.
Kapukari, To cut off bark from tree or stick
Kapu kiri, Leathern shoes (v. Kiro).
Kara (Karu), (S. K.), To make, form.
Kara imi, To make clothes.
Kara kami, To roll along.
Kara-kara, Snail.
Karaku (S.), Nephew; Mat karaku, niece.
Karambe, A thing made (S); Shiné to karambe, a thing made in a day.
Kara ni (Akadama T. Elm. Tree?
Kara-shiuma, Flint (China stone).
Kárasho, Block on which by turning a stick fire is obtained.
Kárashŏi, Hole in which the turning stick is placed.
Karaye (S), To call in to see, visit.
Kari, To stretch over, exceed.
Kari kemu, The shuttle with threads wound (or stretched) on it; v. Kari.
Kari-kiso, The sticks with which fire is obtained.
Karimba ni, Cherry tree (Pfz.), with the bark of which the arrows and quiver are bound.
Karip ashite (? Karipa), A game for children with rings and sticks.
Karishi, A hoop or tub.
Karoku, Grandson by mother's side.
Kase, Leg.
Kasha (Jap. kasa), Hat 笠.
Kashi or Kashikore, A hut to pass the night in.
Kashiikirigushi, Island rat.
Kashiu, To wade over; Bet' kashiu, to wade over a river.
Kashi yobi yuki, To save (S.), help.
Kashupú, A ladle.
Kas' shiuma, Steel and flint.
Kata, Upon; above.
Kataki, A ball of thread (in weaving).
Katakura, Name of plant; red flower; the tiger-lily.
Kat'tsi, The turned stick for setting fire.
Kaukau, Hail 丸雪.
Kaya (S.), A sail.
Kaya-ni, A mast (Pfz.).
Kaye, To break (or Kō kō).
Ke, Oil; grease (K.).
Ke (S.), reflex. pron. pref. (Den.).
Ke-ăne ku mat nepo, My eldest daughter.
Ke-ăne kupoho, My eldest son (S.).
Ke-éra (ajiwai), Taste; flavour.
Kei aikapp (S.), Unable; cannot.
Keiki, Under the knee (S.), cf., Koka-shap'.
Keke shita shita, No! no! it is; it is.
Kem' (U.), Blood.
Kem', Needle.

Kema buni, One of the steps in dancing; a sort of Irish jig style; the "stamping" step.
Kema (S.), The leg.
Kem an, A famine.
Kema ohai kara (S.), To kick (Den.).
Kema shaku guru, Man without feet.
Kema-ure, Leg.
Kema-uspe, A household box or tub with feet, v. Shintoku.
Kemmara (seto mono), Crockery.
Kem mu, Hood.
Kemnu, To bleed.
Kemorit' (suji), Small sinew.
Kem ramu (ki kin), To suffer hunger.
Kem ramu an, Starved out.
Kemú, Blood.
Kenasu guru, A viper.
Kenatomni, Green colour (S.).
Kene, Elder.
Kenoma, Hair (of body).
Kensha (U.), Uncle.
Ke-numa-ush (S.), Hairy; full of hair.
Ke ok', To sell (of oneself).
Ke ot'tune (害 gai), Injury.
Keptenka (K.), A bat, v. Kapapp (S.).
Kepuru (S.), An article of dress.
Kera, To taste, flavour, taste.
Kérai kushiu (o kage) your protection.
Kerai-kushiu, Protection.
Kerampitch, Do not understand.
Kerat' muye, To tie sandals or shoes.
Kera-uen, Nasty (in taste).
Kerawe (S.), Antennae of the snail.
Keri (U.), Aino snow shoes.
Keri chep-kap' keri, Salmon skin boots.
Keri-keri (Jap. sappari), Quite; fully.
Keri yukf' keri, Deer-skin boots.
Kes' (Kesi) in tō-kes', Afternoon (S.).
Kesh' kesh ochichit, Alpine rose beetle (S.).
Keshi, Every (S. U.); Jeder (Kl.).
Keshi amba, To run after.
Keshi pa, Every year.
Keshikarun, A forgotten thing (S.).
Keshi to, Every day.
Keshō-keshō, Spotted (S.), (like leopard's skin).
Keshupp' (S.), Ankle.
Kesorup', Peacock.
Ketobi, Spike or spine (or shells, etc.), (S.).
Ke-ush'-yut', Uncle 伯父.
Ke ushi yuta, Uncle.
Ke utomo yukke guru, Man of bad temper.
Ke utomo, 情, Intention; will; heart; feeling.
Keware (U. S.), High; tall.
Keweram (U.), Low; short.
Kibin, Hate.
Kibiri, Mountain.
Kidai, The top of a mountain.
Ki (事 kotō, Jap.), An affair, thing.
Kii, A louse.
Kik (Sch.), To strike; Aën kik (Sch.), to be struck.
Kikar arip', Strips of wall-paper (oshi buchi).
Kiki, To scratch (S.); Kigi.
Kiki ni, Prunus Padus.
Kikiri, An insect (S. K. U.); prob. fr. Kiki, the scratcher.
Kikki-ku, To strike.
Kik tapkara, (S.), A posture in the dance.
Kiku-uke (Jap. suki ma), Opportunity; leisure.
Kimampe (U.), A bear?
Kimbu ikesh (S.), Point of horn (stag's).
Kimi (Jap. lord, gentlemen).
Kimita, Mountain (also called nobori, Jap. MS).
Kina, Aino mat.

Kina (U. K.), Grass? cf., mun (K.).
Kina bo-u, Floating wood (ukiki).
Kina-hoshi (habaki), Leggings; embroidered.
Kina mun, Mat grass.
Kina tom ni, Green, of leaves or grass.
Kinium kamoi, Bear god.
Kinkai (te ni-motsu), Good in the hand.
Kin machis'ru guru (yoi no men jiyu).
Kinnai, Grass.
Kin op' (jin), Kidneys.
Kinta (v. Kimita), (S.), Hill.
Kinte an (K.), Trees.
Kinupu, Kidneys.
Kion kian, To rub in hands as fire-sticks.
Kipepo, Trout (S.).
Kipotoru (U.), The forehead.
Kira (S.), To run away; to turn self round in fright; looking round.
Kirau, A horn (stag's, etc.), (S.); Kirau nitek, 1st branch of.
Kirau-ush pachi, Ear basin.
Kirip' (aburami), The fatty part of flesh.
Kiro an ambe (K.), Entertaining; amusing.
Kiro, Leathern shoes, cf., Keri.
Kirora, Suddenly; Kirorante (giyotto shite) in a surprised, astonished manner.
Kirorante, To call a fool.
Kirorashap, (S.), Tired.
Kiro'ro, Health.
Kiroro-hirika, Restoration to health (Hom puku) 本復.
Kiro'ro shino, Good health.
Kiro'ro uen, Bad health.
Kiro shite, Level ground, cf. Idaru pirika (Kr.).
Kiro-ush, To have shoes on, (Pfz.)
Kiro-ush te, To pull shoes on.
Kisara nuburi, Bare mountain.
Kisara, Cat (cf., neko).
Kiseki, End.
Kisha-kisha (J.), To bore.
Kishara, Ear; ear poir; ear pick.
Kisheri (Mos.), (Db.), Tobacco; a pipe.
Kishima, To grasp at with the hand.
Kishima an (S.), To seize; to take hold of round the body.
Kishima teku, To be depressed.
Kishita, Mountain.
Kitesh, (S.), Kind of lily, used as medicine; root used probably.
Kitoi mama, The ridge-pole of a roof.
Kiu, A plant of which Ainos eat the root; the lily.
Kiuta chap, 9th month (Sch.).
Kiyo, ケフ 崩, To fall (of a mountain), landslip, death (of king).
Ko, A prefex-particle reflexion,=self.
Ko, Floor, Jap. word.
Kobe, A wild duck, v. Kobecha.
Kobett' cha, Small duck.
Kobichi, Gets away (as an eel slips away from your hand).
Koboru, Side (mountain side).
Kochake, Forward (S.).
Ko chan-ko, It is not; don't, cf., Kopan (S.).
Kochi, Floor, ground.
Kochi-uen, Bad flow, meaning uneven.
Kode, To tie up (as horse).
Kohonnoye, To punish.
Koi, Wave.
Koigi, Curse.
Koigi an, To curse, scold.
Koi hok (U.), To buy (sp. of oneself).
Koiki, To catch (fish, rat).
Kokai-a, To kneel down.
Kokan tama (K.), To cheat.
Kokkobuda, The knee cap.
Koko, Bride (Dav.).

Kokobu, Sheep.
Kokosaba, The knee (S.), Kl. Kokashap.
Kokoye, Son-in-law.
Kombu-mui, N.; place seaweed.
Komó, To fold, (Pfz.)
Komun, Chaff.
Kon (Kl.), Shaft of an arrow.
Konde, To divide.
Konehi (S.), Your house.
Kon gari, Feathers.
Konji (S.), Hat, cap.
Kon kane wakka, Gold leaf.
Kon kani (?) Silly.
Konkari, Gold.
Konko, Ring of a bell.
Kon naripe, Aunt.
Konoburu (S.), Lovely, to like.
Konopuru (K., Wanted).
Konru (S.), or kondru, Ice.
Kon-rushini, To wish; Kon-rushui (S.).
Kopan (S.), To dislike, Don't (Jap. iya!); not wanted.
Kopande (S.), Hateful.
Kopecha (S. U.), Wild duck.
Kopichi, (v. Kobichi).
Korachi, Like; as, Tan —, in this manner.
Korachi nukara (S.), As you see.
Kore (S.), To give.
Kore (or Kure) ambe tate (S.), I will present these to you.
Kore anna, To give.
Koriu (S.), If.
Koro, If.
Koro an, To have, possess.
Koro gum, Petasites japonicus.
Koro guru, A master.
Koro kai (Jap. nagara).
Korokoni ham, Large leaf used as an umbrella.
Koro okōni (S.), Fuki plant (akashi).
Koro wa, With, by means of.
Koro wa ek', To bring.
Koshake (S.), Forward.
Koshima, Daughter-in-law.
Koshi shuye, To nurse; — hekachi, to nurse a child.
Kosh'matne, To marry.
Kosh'matsi, A bride.
Kosh'ni, Light (opp. heavy) (K.U.S.).
Koshni tsip, A light boat.
Kosh' po, A bow (U.).
Kosh'to, Name of a pre-Aino race.
Kosungi, To deceive.
Kotamu, Attraction.
Kotan, Place, country, village (S.U.).
Kotan-buri, Manners of a village (S.).
Kotan-karà, To settle one's self, become domiciled.
Kotan-karà kamoi, God of the village.
Kot'cha, Before, (coram) v. hosh'ke, before.
Kotokai, Least of the Aino chiefs.
Kotoro, In, within.
Kotsu chaki, Before (coram).
Kott', If (S.).
Ko wen, To dislike, hate.
Koyanto no, Master of a family.
Koyeki (U.S.), To catch (v. Koiki).
Koyekori, To meet.
Koyeram' petek, I don't understand.
Ku, I; also auxil. of to do; reflex pron. prefix.
Kū (or kfū), A bow; — akk', to shoot with a bow.
Ku-a (S.), A stick, a pole, a staff.
Ku áni, I (to superiors), káni (S.), kaáni.
Kuannŏ, To balance, or a balance, a steelyard.
Ku apo, A small boy.
Kuba, To bite at (U.); Kubaba (S.).
Ku chiya, 家 House.
Kuda, To wake up (Dav.).
Kue kai-chup, 4th month (Sch.).

Kufu (or Kfu), A belt.
Ku goro, My, mine.
Kui-kui, Snipe.
Ku-itaku-ani akkanka ri, To show decision with regard to what one tells.
Kū-ka, A bow-string.
Kukahi, A shoulder.
Kukeri (S.), Deer skin boots.
Kukime, 天 Heaven.
Kukkani, Coin (?) Dx.
Kukohu, My husband (U.).
Kumadaki (S.), Younger sister.
Kumani, A beam.
Kumontabi an, I am busy.
Kunai, Kind of medicine.
Kune a-u tap'ke, Repairing, being repaired.
Kune-ni, Species of pine (unko-matsu).
Kungi, (Jap.) nail.
Kunip, Business.
Kuni ramu, Think of again, remember.
Kun kutsu, A kind of eagle.
Kunnan, Morning (U.S.), v. kunne.
Kunne, Black, dark.
Kunne ambi, Black ink.
Kunne chupp', The moon.
Kunne ibe, Supper.
Kunne iwa, Morning.
Kunne tamo, The pupil of the eye.
Kunne wa ibe, Breakfast.
Kunne wa no, This morning.
Kunne wa sokeri, To become black.
Kunniba, (v. kunne-iwa) Morning.
Ku noshki, Middle of a bow.
Kup (S.), Skin.
Kupa (U.), To bite at.
Kupka, Iron; a mattock.
Kupsa, End of girdle (ornamented).
Kupuka, Iron?
Kura, A smell, v. fura.
Kura uen, A stink, v. fura-ueh.
Kure, Red (S.U.), v. fure.
Kure ambe tate, I present to you (S.).
Kuri, Shade.
Kuru (guru), A man.
Kuru gira, Gills of fish.
Kurumo, To sit down.
Kurumshika, To sit down, (Mats MS.).
Kurumuse, Aborigines of Yezo.
Kuruppe (S.), A den.
Kuruppi (U.), Ten (10).
Kushabo (S.), Elder sister, opp. to iriwaki (S.) or turesh (Kr.).
Kushán, A forked stick used in the bear's trap.
Kushita, Opposite.
Kushita an, Is over yonder (v. tampata an.
Kushiu, On account of (Jap. kore ni yotte), by this means, like kara Jap.
Kushiu, Sign of future tense. ? Rushiu, to wish, will, future auxiliary.
Kushni (v. Koshni) (S.), Light, opp. to heavy.
Kusnept, A pigeon; kusu wept, and kusui.
Kusu, To come, sign of the future.
Kusu, Sign of interrog.
Kusu (S.), For the sake of, purpose.
Kusui, A pigeon.
Kusuncha (K.), To cross.
Kusuncha pechika (K.), To cross a river.
Kusunchata (K.), Crossing a river.
Kusuwept (S.), A pigeon (Kusui) (S.).
Kut' (S.) (Kr.), Girdle; Kut-etu, nose or end of the girdle.
Kut korasui, The loins; v. kuto.
Kutsu ne, Girdle.
Kuttaka (S.), Whether.
Kuwá, A stick.
Kuwaré (S.), Trap for bears, cf. Kushán.
Kuwat, A bowstring.
Kuyubo (S.), My elder brother.

M.

Ma, To swim.
Maa, To roast (S.); Kam' mā (S.), to roast flesh.
Mach-higachi, A girl.
Mácho (matsu) hamu tanne hup, Small firs.
Mada, Winter (mata).
Mada a hup hara, To marry.
Madomai,=Matsumai.
Magiri, Knife to cut food.
Mahe, var. of nai, mai 澤, marsh.
Mai, var. of nai, 澤.
Mai shiu no kuni, Manchoo (beads from thence).
Maji, A wife, cf, matsi and machi.
Maka, Open; Apa-maka, Open the door.
Makan, To ascend a river.
Makanik', Upper part of arrow made of stag's shin-bone (Sch.).
Makanruru, The flood tide (Dv.).
Make, An anchor (makke).
Makiri (magiri), A knife to cut food.
Makiri nit', Haft of a knife.
Maku amunin (S.), The arm from the shoulder to the elbow.
Maku-idre, 2nd joint of finger.
Makun tapusado, Muscles of the arm.
Makurabu, Gills of a fish.
Mama, Hunger.
Manshiro, To whistle (maishiro).
Maréppo, Fishing tackle, prong, harpoon for spearing salmon.
Marré, Simple fish-hook (Sch).
Masashin toko, A wine tub?
Mash'kin no (Jap. iyo iyo), Still more, certainly.
Maski-shoya, Mother island.
Masu, Name of a female relative).
Mataki, (S.), Younger sister.
Matap'pa, The coming winter.
Mat'nau, The north.
Matneba or matnebo (S.), Daughter; Ku matnepo, my — (S.)
Matne-hida, A bitch (S.).
Matsi, Girl, wife.
Matsi karaku, Niece.
Matsi shiyaku (otoko yamome), A widower.
Matuo, The north.
Mau, Shoreless (hama nashi).
Ma-uberi, To crack.
Ma ukushi, To pass through.
Mawe, Breath, air; cf. Hau-e.
Mayaike, To rub or scrape the flesh.
Me an, Is cold; Tando me an, to-day it is cold.
Me-an-ba (pa) ek, Cold year comes= Autumn.
Me-an-kotan, Cold country.
Mechako, A skull.
Meko, A cat (Jap. neko).
Membi, A female relative.
Membiro, Garlic.
Memu? Old river.
Menashi (S.), East.
Menashi guru, East Yezo men.
Menge, To shave.
Menoko, Woman; Menoko samguru, womanish.
Merai-ki (S.), To shiver with cold.
Meráki, Cold.
Me to an, Quiet, calm.
Mi, To clothe (imi).
Mi ambe, Clothing.
Mi-an, Comfort.
Michi? Father; Kumichi, my father (S.).
Michipo (mit'po)? Grandmother.
Mik, To bark.
Mimaukerere, To gnash the teeth.
Mina, To laugh.
Mip-teine (S), Clothes wet, damp.

Misam, Collar.
Mishnu, Cold (of weather), (S.).
Mo, Small (as in word Mororan); also quiet, calm.
Mo, A span fr. thumb to second finger.
Mo-chupp, 11th month.
Moi, To cut (grass); Mun-moi (S.).
Moi, var. cf., Nai 澤. Marshy land, marsh.
Moï, A strait, gulf.
Moi moi, To move.
Moi na, Not sleeping.
Moi shut ikari, To knock down.
Moire, Late; slow; Mo-ire-tara (S.), gradually.
Mokon-mo-ui, Sleepy; Mokon-rushui, very sleepy, wanting to sleep.
Mokora, To sleep.
Mokoru, To sleep; Mokoru o (nemure yo), go to sleep.
Mokoriri, Bugle shell.
Mokora (nemure), Go to sleep.
Mokuida chupp, April.
Mokuri, An Aino musical instrument, a Jew's harp.
Momanbe, Doe (of deer).
Mombets, Finger or toe.
Mombets on kane, Finger ring.
Momori (Jap. mono shimau).
Mono, Work.
Mono okai, Quiet; still.
Mon pachi, Dust.
Mon suk, To yawn.
Montabi, Busy? (S.).
Mose, A nettle.
Moshiri, Island, the world; Moshiri uturu, frontiers or straits.
Moshiriba, The east.
Moshirigish, The west.
Moso moso, To rise up from sleep.
Mosuma, Another (man).
Moyuk (v. Muyuk), A badger.
Mron, To flow (as a river).
Mu-a-po, Rice bowl, (Dx.).
Mui, A wicker tray to gather up dust sweepings.
Mui koiram, Together.
Mui mamba (Jap. shitaku), Ready.
Mui nak, To wake up.
Mui sapte, To sweep, brush.
Muk (S.), Kind of plant eaten, root like potatoes.
Mukan de, A centipede (gejigeji).
Mukára, An axe.
Mukkane-ni, A round log of wood.
Mukkuri (Kr.), A small musical instr. like the Jew's harp, made of bamboo, with a tongue of bamboo, having strings attached to each end 4 or 5 inches long.
Mukotap'tap, To roll up.
Mukun bets, Branch of a river.
Mumanda chupp, June.
Mumbe, The rainy season; (Muni be), grass thing, dew.
Mun, Grass.
Mundai (?) To work, labour.
Mun ibui, Flower of grass.
Munin, To rot.
Muni wakka, Grass water=dew.
Mun osura ushi, A dunghill.
Mush, A fly (S.).
Mushiukéna, A plant used as medicine, by infusion.
Muyak (or Moyuk'), A badger.
Muye, To tie, bind up (S.), (v. shiná).

N.

Nā, (Na-a) Not yet; Na-ane-no, not yet thin.
Na, Afterwards.
Na a ma-ire-no, Not gradually.

Nai, A stream (Kr.), 澤 sawa, marsh.
Nai chap.
Nam, Cold.
Nam wakka, Cold water (nannaka).
Nanda, The deck of a boat.
Nan koro, Will have.
Nanu, Face.
Nanu bori pirika, Form of god.
Nanu furai shintoku (Kr.), Wash hand basin.
Nanu isham, Dishonorable.
Nanu-uen-chepp, Kind of fish (Jap. kajika) the "river deer".
Napun no, Afterwards.
Natte imakari, To adopt.
Ne, Together.
Ne ak ne, If.
Ne bak'ne? How much, (pronounced *ne bakh'ne*).
Ne bak no, Whither?
Nebiki (nebege) (Kl.), Light.
Nebusu, Because.
Nejiki newa, If.
Nekata, In the sunshine.
Nekon, What.
Ne-konne, Unite, (Pfz.).
Nema, Bowls or basins.
Nemba, To pull down.
Ne nankoro wa, Perhaps.
Ne no an, Like (Kr.).
Nen (Neni), 誰 Who?
Nen goro (koro), Whose?
Nen ni yakka, Anybody; some one.
Neni ni yakka isham, There is nobody.
Nep' (? fr. Ne-be), What (thing).
Nep-a-ku-no, How long? (have you been here).
Nep' ne, Something; anything.
Nep' ne akka yeram pitch guru, A dunce.
Nep' ne ekka, Some business.
Nep'-okai-sham, Nobody.
Nep' ta, What.
Nepu itaku yakka kara kuya, Something to do with whatever is said.
Neru we, Is it not?
Neshi ko ni ka repp, A sort of flute to blow 胡桃笛.
Neta? Where?
Neta-uturu, Which side.
Ne to bake, The body of animals, of the inao, etc., (neto bogi), the stick.
Ne un, And also.
Ne wa no? Whence?
Ne wa an be (Jap. sono dan).
Niak, A little.
Nibappu, Fish or rice bowl.
Nibeshi, Tilia cordata, bark of which is used for nets and ropes.
Ni buri (v. Nuburi), Mountain.
Nichi kuru (H.), Clouds? above, to ladle out.
Niha, Afraid, cf., (Me).
Ni-ir'e, Connected with tatooing.
Ni kabu, Bark of a tree.
Nikaparus', Aino dress (of elm bark fibre).
Nikara? stripes? (S.).
Nikara, Notched post for a ladder.
Nikarákusha, Getting fire by sticks.
Niko kara, To fold up.
Niko omari (?), To wrap up.
Ni-má (S.), Wooden fish bowl (mine).
Nimaki, Teeth (var. Imaki).
Nimaki aruka, Toothache.
Nimaki ashin, Front teeth.
Nimba, To lead (as a horse), to pull (as a sledge), draw, (S.).
Nimbe rogu, Chief king of Ainos, whose residence was at Paru, now extinct office.
Nimŭ, To climb (a tree).
Nin, To melt.
Nin-chupp, Half-moon (Db.).

Ninge, Gall-bladder (Sch.).
Ningari (Kr. Kl.), Ladder.
Ninkari, Ear-rings.
Nin nin-geppo, Glow-worm (S.).
Ninu, To saw.
Ninum, Walnuts (Kr.).
Nipes (Tilia asgentea), Linde.
Nip kai sham (Nip okai isham), No one.
Nishabi, Lower part of the leg.
Nishapp' (S.) shin, cf. Utsikam.
Nishatek, Daybreak.
Nishatta, To-morrow morning.
Ni-shi, Fire sticks.
Nishibo, A hare.
Nishi mu, Lonely; Nishi mu o *ckyrro* (Db.), feel ennui.
Nishi mu an, Fear, awe, dread cmpaxre (Dav.), (Db.).
Nishi oman, To think, reflect, (Db.).
Nishiomap, Memory, mourning recollections which remain in the mind.
Nishi pa, The upper one, rich man, you, sir! in address.
Nishite, Hard.
Nishi te bokunashi, Higher hell, v. Nojiu nichi.
Ni shiu, A wooden mortar (Jap. usu).
Nishi uro, The heavens (Db.).
Nishi yapp, A buffoon; sudden, unexpected.
Nishni-kamoi, The Devil (Db.).
Nishshi (Db.).
Niso (pestle and mortar), Mortar (Sch,).
Nit, A rib, a bone.
Ni-tai, A wood (Ni-tei), (S.), a forest.
Nitat, A swamp.
Ni tik (Ni-tek), A bough; Ni shin-rit, root.
Nitne Kamoi, A spectre (Jap. oni).
Nitne-okoko, A very poisonous black snake, about 2 feet long.
Ni tok'pa, To tap, to peck a tree (as wood-pecker) Nii, a tree (v. Chikuni), wood.
Nittne daimon, Thalictrum thunbergii, used for poultices (Med.).
Ni tundum thonno.
Ni uen? To growl? or grovel.
Niu fu, Squirrel.
Niu raku, September.
Ni-ure, The gums (Niruendu).
Niyatui chupp, 7th month.
No ambi? To ask.
Nochiu (Nojiu), Star.
Nogi (Naku or nuko), Testes.
Noi-be, Brain (v. Nuibe and Noi-poro).
Noi boro, Forehead.
Noi do, To shine (as the sun).
Noi karu, To arrange the head-hair.
Nojiu, 3rd Heaven lower H. good; Noiju bokunashi, lower hell,
Nokaka, A map.
Nokkoro, To lay (as an egg).
Nokon (=Jap. naruhodo), Indeed!
Nokuyăkă, (S.), Swallow.
Nōna, Sea-urchin.
Nondabi, A buoy.
Noni, Saliva.
Nonno, Flower.
Nori, To aim.
Noshike (Noshike ta), Middle (S.); Noshika an, in the middle.
Noshi ke ogai yo kupoho, My second son.
Noshike tek bet, Middle finger (Sch.).
Nosh'ki ki, Centre of a circle.
Nososo, To rouse up.
Nos pa, To chase (?).
Not'a (not'ka), Strings to bear's trap.
Notak', Point or edge of knife.
Notankam, Cheeks, (Noyabi, Sch.).
Not ka, Long strings to the bear trap with bow and arrow.

Net'kiri, Chin (Sch.).
No-to-an, Calm; Atui no-to-an, quiet sea.
Nōya, Wormwood, Artimesia vulgaris, mug-wort, from which Moxa vulgaris is prepared.
Noye, To twist.
Nu, To hear.
Nube, Tears.
Nuchatteka yakka, As one rejoices.
Nu ina, To hide (Nui nak's), to draw in (of snail's antennæ).
Nui sham, Fringe (Jap. heri).
Nukaru, To see; Nukaru nu uen, bad to see, ugly.
Nuk'te, The temples.
Nuku (Kl.), Eggs; v. nogi.
Numa, Hair; Numa us, hairy (S.), (Pfz.).
Numa ashi kikiri, Caterpillar.
Numan, Yesterday, (o numan S.).
Numara, The half.
Numba, To express, squeeze out, pinch.
Numba shake, Expressed wine, muddy.
Numbi (or numba), To pinch.
Numi, Square measure.
Numke ku, To choose, select.
Num'sham (S.), A collar.
Nup, Agriculture,=no 農.
Nup'ka, Field, wilderness.
Nupke ats, Muddy water (Pfz.).
Nu-rusui (rushui), Desire to hear.
Nuta-rapp, Gills of a fish (S.)?
Nuto-ukari, Fainting (Pfz.).
Nuye, To write.

O.

O, 在 aru.
O, (S.), To ride, (of another) in speaking of another; Ko, when speaking of self.
Oa (S.), A frog; Oa chishi, the frog cries.
O-a-chikir' ni ash, To stand on one leg.
Oado (oato) Semen (Sch).
O-a-u-ush kikiri, Stag beetle.
Obambaki, Shrimp.
Obas (wabase), Snow.
Obaship'ship White Equisetum Xyloch.
Obat (opab), To pierce.
Obatte (Kr.), Joined.
Obeka (Opeka), Straight (Sch).
Obesh, obompe, Trousers.
Obiabia, To bore Dx.).
Obitta, All; — anbe, all things.
Obitta, All; — Aino, all men.
Obosho, To bore a hole, or cut with a chisel.
Oboso (Jap. sui komo) To absorb.
Obush', To tear.
Ochiyue, 遺失, To lose (things, money, etc.).
Ochiki, A tray.
Ofni ambi, Small girdle.
Ofunaku, Lately, a few days ago.
Cha, Empty; — chipp', an unladen ship.
Ohai ni na.
Ohak (S.), Shallow, low.
Oheri, A girl.
Ohiyo, K. of tree, bark medicinal.
Ōho, Deep (O ōho), (S.).
Ohonno (S.), Long time.
Ohonno nukara (S.), To look for long time.
Oikush'te, It leaks.
Oipakari shiyaka, Young man?
Oïra, To forget.
Oïshi, (S.), The tail of a bird.
O itaku sut, To be defeated.
O itaku sut an, To confess.
Okai, A man, a person; — O samgaru, manly.

Okake, Beginning.
Okake-an, Finished.
Okamikot' (Kl.), Sickness, (ogami kos).
Okan, To hide.
Okatuiba (S.), To press.
Oka-uchi, Helm (?)
Okayo, A person.
Ōk'chishi (S.), Valley.
Oke-we, To throw away, drive away (dog.)
Okikurumi, Minamoto Yoshitsune.
Okirashino, Strength.
Okoima, To make water.
Okoko (snake?), v. Tame.
Okopoye, To mix together (S.).
Om (S.), Thigh; Om chikiri, hind leg (of dog).
Oma, To lay (? eggs).
Omambi, Long hose.
Oman, To go, 行 (Kr.) Oman! Oman! go! go!
Omande, To send.
Omanikush'ni, Styrax Sp.
Omaryubo (Kf.), Kite (plaything).
Ombaku, Leggings.
Omke.
Omke kara, To take cold.
Ómki, Acute fever (Sch.).
Ommki (Ongrunki), Coughing.
Omoi-koro, Adultery.
Omoro roshi (Jap. waza to) Intentionally.
On, To dig (?) Ou? cf. O-urei.
Onaiketa, Inside (S.).
Onak'ta, Where is? (S.).
Onashi, The skull (Kr.).
Ondara (S.). (Jap. taru) Pail, tub.
Onefúdzu, God of fire (?) Onefúdzu (Sch.).
Ongamu (Jap.), To pay respects, to bow.
Onip, The seal (Blk.).
Onne (S.), Old man.
Onuman, Evening 今夜 to night.
Oomuke, To cough.
Opa-an, Ah! ah!
Opechini-a (S.), To sit down.
Opéka (S.), Straight.
Opéka an arapa (S.), Creeping, coming.
Opki, To spear, pierce.
Opkis, End of harpoon.
Opoke, Let wind.
Opp' (apper) A spear, for bear hunting
Opu (ta), Tobacco case.
Ora-no, My, (here).
Oren kari (Kr.) Fixed, appointed.
Ori (?), Jap. saka, A hill, cliff.
Oribak', Humble, I am sorry (kinodoku).
Oroitaku, To read.
Oron chisei, A hunting box.
Oropak, As far as.
Oro-wa, 從 From; or Oro-wa no.
Orun, Towards.
Osa, A loom.
Osahari, Change.
Osarai (Dx.), To separate (cf. usarai, H.).
Osaru betu (betsu) (oshiyarubetu) The river in a swamp 澤.
Ose kamui, Wolf.
Osekato an, To forge.
Osha, A prismatic shaped stand to support the threads in weaving.
Oshaganke, To call.
Osharekino, N. of a Saru-man.
Oshi, Behind, (oshimaji).
Oshie-kam (U.), Woman's belt.
Oshikarumba, Round.
Oshike, To net, make nets.
Oshiki, Spirit, inside; — araka (S.), sick in stomach.
Oshiko, Beginning or begin.
Oshimake Kr.), Behind.
Oshimu, The rump.
Oshiora (suteru), To throw away, behind.
Oshipit, To return.

Oshipit'ri, To cause to return.
Oshiri, To be surpassed.
Oshiro, To go, enter; Chipp' —, to go into a ship.
Oshirush', To cause to return.
Oshiu, Bitter.
Oshiuro (oshioro), Anus.
Oshiuro-ma (Jap. daiben), To go to stool.
Osoma, Excrements.
Osoru, The posteriors (oshioro).
Osuru, To throw.
Ota, Sand (otaru) (S.).
Ot'chara, Fish-tail.
Ot'ke, To spear; op'ani ot'ke (S.,) to spear, v. opki.
Otek'mikuru, Riches.
Oteriki, To tread, to kick.
Oteshuruki, Pure.
Otobi, Hair of head (otto or ŏtŏ). (otop', S.); — kishima, to shave off the hair (S.).
Otomutuye, A cross.
Otosamne an, To lie down.
Ōtta, Postposition 所, to (place, person).
Ott'ena, Chief of village.
Otup', Pipe-case.
Oturoki, Between.
O-urei, To dig; Toi o-urei, to dig the ground.
Ou-se, Only.
Ou-se shinep, Only one.
Oweye! Away with! Sheta oweye! away with the dog!
Oya, Outside, other (oyaku, Pfz.).
Oya, 自分燒, To cook for self.
Oyai betsu, The river where "you cook your food" (Jap. Chimai betsu 千舞別.
Oyak'taman, To part.
Oyaku', The other.
Oyamuk'te (Kr.), What sort of a thing is that?
Oyapa, Next year, or oyaba.
Oyashimi, The day after to-morrow.

P.

Pa (S.), A year.
Pa (Ba), Smoke.
Pa, To find; to pick up.
Pa, A thing found, (Pfz.).
Pachi kuro (S.), A crow (karasu).
Pai, A kind of bamboo (Pfz.).
Paigara (Baigara), Spring of the year.
Pai-ka, A spring (?).
Páki (S.), A shrimp or prawn.
Pakkai (Bakkai) (Kr.), To carry on back.
Pakko, An old woman.
Pak'no ka-gi-an, To stop, leave off.
Pak'no, Unto, to.
Pan, Sweet; v. topin (S.), in taste.
Pan, Sweet (wine); opp. to Runno, sour.
Panadate, To go to the coast.
Panake (S.), Thigh.
Panata, That, down the river; perhaps merely down that way.
Pánata (S.), Down the river.
Pancho Banjo), Carpenter; Pancho mokara, — adze.
Papush', Upper lip, v. Babushi.
Para, A spoon (Kl. Parabash).
Párakara (S.), Bitter, pungent.
Paratek', The hand.
Paro, Mouth (Baro).
Paro-hinuye, Tatooing round the mouth.
Paroho (S.), Mouth (of dog).
Parumbe (S.), (Barumbe), Mouth.
Parumbe shione, Dumb.
Pase, True.
Pashi, Ink; Pashi, heavy.

Pashi kuro hawe'ash', The cawing of crows (S.).
Pashui (S.), Chopsticks.
Pas pas, Coals (Pfz.), charcoal.
Pateki (Bateki), Only (S.).
Patoi (S.), (Badoi), Lower lip.
Patoi tururi, To pout, throw out the lower lip.
Pattek', To burst (as volcano).
Pau-ta-shat', To change, vary.
Pau tsukúrube, To break.
Payara (Bayara), (S.), Window.
Peka-app'kash, To walk (of an animal).
Pekambe, N. of plant, dark coloured flower, creeping, perhaps ginger.
Pekange (S.), To float.
Peka-ot ne (B.), To separate the threads.
Peka-úni, Horizontal support for threads in weaving.
Peke-chkapp (S.)? A walking bird.
Pénata (S.), Up the river.
Pen-ram', The breast, chest.
Pera, A spoon (S.), a shuttle.
Perai, A fish hook (S.).
Perangai (Kai), To row in the sea.
Peripa, To split, break up (ship) (S.).
Pet' (Pech' bets), A river.
Pet' kama, To cross over by striding; Pet' kashu to wade.
Petu ne (Betne), Moist, wet.
Pet urun-chip, A river boat.
Pe-ure (Pfz.), Young (S.).
Pe-urepp, Bear's cub (S.); Pe chisei, cage.
Pi, To untwist, cf. Pita.
Piba, An oyster (Pfz.).
Pichira, Stool.
Pikata (Hikata), South.
Pikata, Method.
Pikata réira uen, S. wind is bad.
Piktuk, Archangelica gonolini.
Pin doro, Cup (Sch.), (S.).
Pinni, (Yashi tamugi), The ash (B.).
Pira, Bank of a river.
Piraka, Wooden shoes (Pfz.).
Pirasa, To spread out (as a mat).
Pirashipa (Bi . . . .), To open.
Piri omare, To stab (Biri omare).
Piriba (S.), To wipe.
Pírika, Good, pretty; Pirika no kara, to make good.
Pirika no kado karu, To conduct one's self well.
Pírika wa, Safe, certain.
Pish'ke, To count.
Pita, To, until.
Po is used as a suffix something like wa in Japanese; Emush' po, a sword; Pon-be-po, a small thing; Ikoro-bo, a possession; Oiman no-po, the going away; Okai-po, a man.
Pō, Useful (Dx.).
Poat, Menses.
Poho, Son; Kupoho, my son (S.).
Poi-poi, To pick out, excavate, to grasp, to clutch.
Pōke (S.), To jump down.
Pombarubi, The palate.
Pon, Little; Pon moshiri, little island.
Pon-be-po, Trifling, slight.
Poné (Bone, boné), A bone.
Pon eraman, He knows little.
Pongau (Yachi kamba), The birch (B.).
Pon kamui, Tambourine of seal-skin.
Pon koro menoko, Enceinte.
Pon maji, Concubine.
Pon otténa, Under chief.
Pon-pon pet' pet ke, Indented (as a leaf), serrated.
Pop'kei, Hot.
Popu-an-be (Bop popu-an), To boil (S.).
Popu-rai-ke, Sweat (Pfz.); — hetuku, to produce sweat (S.).
Poro, Great; Poro maji, chief wife.
Poro kushiu, Great.

Poro-no, Great, many, clearly.
Poro-no ambi, It is large.
Poro-no askibet, Thumb.
Poro-no ke-ramu-an, He knows much.
Poro otténa, High chief.
Poro-toro, master (Dx.).
Posori, To murder, (Pfz.).
Pu' (Puh), A storehouse on props (kura).
Pu (=者 Jap. mono), A person.
Puda (P'da), A roof (S.).
Pukushá, Kind of edible plant.
Pu-ne, To lift (Pú-ni, S.); Toi-toi pú ni, — earth.
Pun gan (B.), *Arataigen* Sp.
Pungara, A grape vine.
Push-ni (hon no ki), Wood used for carving.
Puta-un (Pachi), Cup with a lid.
Puyara (cf. payara), Window; Ri-puyara, high window.

R.

Rai, var of nai mai 卑キ處津.
Rai (S.), To die, death; — guru, dead man.
Rai-ge, (raike) (S.), To cause to die, kill.
Rai-hetoku (S.), Dead-born, still-born.
Rai-isham, Useless.
Rairak, Smooth (S.).
Raka an, To be profitable.
Rakai isham (S.), Lazy.
Rakan, Useful.
Rakasak', Weak, poor, dull (knife).
Rakka, Shoal.
Ram, Low.
Rama an, True, truth, known.
Ramachi, Soul.
Ramepakari, Mind (Dx.).
Rametuk, Brave.
Ram isham, Without mind, fool.
Ramoshuma, To like, love.
Ramu-chup-ke, Shadow of the soul, mind (Pfz.).
Ramudui, Surprised.
Ran, To fall (as rain); Apto —, it rains.
Rangi shiro, To let down sail (kaya).
Ranko, Wood of which river-craft are made.
Ran-man, Always (Pfz.).
Rapp', Wings.
Rapp' chup-ke, Shadow of wings, n. of a beetle.
Rarak', Slippery (like an eel) (S.) v. rairak.
Raramani, Wood of the yew.
Raru, Eyebrows.
Rasau, Blue (Sch).
Ra-uge, Crooked (re-uke) (S.), bent, curved.
Ra-uni, Deep chasm, abyss (S.).
Rebun guru, Tartars of the Kurile Islands.
Redara, Shavings.
Refun, (oki ye deru 沖ヱ), To go out of the bay.
Regi' (reki, rek), Whiskers, beard; — maka wa iku, to raise the moustache in drinking.
Rekáni, A drum (Sch.).
Rekkūp', To fly.
Rek'te, To play music.
Rekuchi, The neck.
Remisé, Dance (Sch).
Rep'ta, Sea, ocean, bay.
Ren, A stink.
Rengai ni, Many.
Réra (reira), Wind.
Réra as, It blows.
Réri (S.), To sink; — ishama, not sink.
Réri-kekki, Breakers, surf (S.).
Reri yan, Wave (S.).
Resha, To bring up.

Retachiri, "White bird," the swan.
Retarara, White.
Reu-ke, Bent,=reu-reu-ke (S.).
Re-ushi, To stay, stop, lodge.
Re-ushi-ri, To cause to lodge, give lodging.
Reu-uri, Young, (v. pe-ure).
Ri, High.
Riji, Veins; Rizi, male genit (Sch).
Rikin, To ascend.
Rikinke, To cause to ascend, lift up.
Rikita, Heaven.
Rik'ta, Above.
Rin-rui, Billows, swelling sea (S.).
Rioki, Bend.
Riri, A wave (S.).
Rish'pa, Together.
Riten-kina? A kind of matting.
Ritin, Soft.
Rochiye, Prison; A hunke —, to put in prison.
Rokan, To sit down.
Ronno, To kill.
Ropūn (ropoon), Flood.
Roshike, To stand, 立.
Rosuki shinot, To dance.
Rotta (S.), Place where you sit down.
Ru, A road; var. Ruye, q.v.
Rū 陸 Land in opp. to sea.
Rubusu, To freeze.
Rui, Great, fat.
Rui, Green beetles (bombom).
Rui, Grindstone.
Ruike, To cause to shine.
Rui ruji, Jugular vein.
Rui tekbet, Thumb (Sch).
Rui tek guru, Servant.
Ruki, To swallow.
Rūka 坂 saka, A slope or hillside.
Rumi, Desire.
Runno, Sour, acid (opp. to Pan) (S.) sweet.
Ru-opp', Marks in the road (S.).
Rura, To send.
Rura-shake, Sweet wine (Pfz.).
Rurru, Acid, sour.
Ruru, Ocean; Ruru sam, seashore.
Rururekara, To smelt.
Rusu, Skin; Rutu, a toy.
Rushi, Leather.
Rusui, Skin of animals.
Rut'turepp (Hokke), A shell-fish, not an oyster, cf. Aketek.
Ruyambe, A word for rain, when fallen; cf. ap'to, rain.
Ruye, Traces, footsteps (ru-ye-hé, S.).
Ruye askibet kiji, Thumb.
Ruye-hé, Footsteps, traces (S.).

S.

Saba shaba, shapa), Head.
Sagada, Diarrhœa (Saida).
Sakange, To boil.
Sakan ram guru, A quarrelsome person.
Sakk' Shak'), Summer.
Sambi, Heart.
Sanike, Descendants.
Saraji, To hold counsel.
Sarahá (Sharáh), Tail (of dog, etc.).
Sără-á, v. Shara-á.
Sarámpa (S.). Farewell.
Saranép, A basket (Sch.).
Sarare Sharare), To open (S.).
Sari, To soar.
Saroru (Sharurun), (S. A crane.
Saruki, A rush.
Sat', Dry.
Sat' chip, Dried fish.
Sat'ke, To dry (in the sun).
Saya, (Jap.), Sheath.
Saya (Shoya), A wasp, bee.

Saba horuru, Brain.
Saha, Elder sister.
Sai mon, Proof of witchcraft.
Sai natora bai, To walk fast.
Sapi, Maimed (Dx.).
Sawara, At entrance of straits, E. of Hakodate.
Saya set', A wasp's nest.
Seburi, The throat.
Sei, I wander (Dav.).
Sekachi (hegachi), Boy, child.
Sekasui-na, To possess.
Seri, Wild parsnip (eaten w. fish).
Seri maka, Ancestors.
Sékem-chupp-póski (Db.), Half moon.
Sekoro, So.
Sempi, A wedge.
Sembi omare, To beat off (Pfz.).
Senkaki, Headband of women (Dx).
Sesek, Hat.
Seshike (Shesheke), To shut.
Set, A nest (S.).
Seta (Sheta), Dog.
Seta kokoro ni, Burdock.
Setura, The back.
Setari, Wild pears.
Seun kikiri, Beetles.
Seyi tomō kohe, 方 Side of body.
Shaba (Saba), Head; Shaba pone (S.), skull.
Shaba-araka, Headache (S.).
Shaba-kara (S.), A barber (kami sori).
Shaba-umpe (Kr.), Cerem. ornament of the head for men.
Shachiri (S.), Ru-isham, roadless.
Shak' (S.), Summer.
Shak, Without (sine).
Shake (Jap. sake), Wine.
Shake-auki aoki (S.), Wine-song.
Shakoshi (S.), Woven leggings.
Shak'ne hetōku (S.), Born last year.
Shak'ne pa (S.), Last year.
Shak'pa, Summer season.
Shaku-um-pa, The coming summer (S.).
Sham', To look far.
Shamata, Also, again.
Shamata kăn, Sitting side by side.
Shamba (S.), Mackerel.
Shambe, The heart (S.), gall-bladder.
Shambe tokin tokin, The heart palpitates.
Shame (Jap. same), The shark (S.).
Shame-epurap, Butterfly.
Shamon, (Jap.) Upper part of arm (Sch.) (cf. amunin).
Shamú-ina, Song (Sch.) (S.).
Shana, To tie up; to tie (S.).
Shanke-ikdre, 1st joint of finger.
Shankke, To publish, to bring out (food, etc.) (S.).
Shan-ra-kere, Hungry Pfz.).
Shép' shinkoro, To stand and stride.
Shapane guru, Sailor of a large ship.
Shara-á, The tail (of a dog, animal).
Sharara, Open! (S.).
Shariki, A kind of rush, reed, to thatch the houses of the Ainos.
Sharorun, A crane (S.).
Sharu 濕津, Wet marsh.
Shashi, A leech; Tō shito poronno an, the swamp abounds in leeches.
Shas-ka-ne-oman, To go fast.
Shaste, To hasten, urge on (S.).
Shat', Dry; Tam bet' shat'chi, That river is dried up.
Shat' chepp, Dried fish.
Shat'ke, Made dry; Tam mun shat'ke, that grass is dried; Chikuni shat'ke, the wood is dried.
Shat'pe, Consumption.
Shatti guru (H.), Leanness, or a lean man.
She'eppo, A snail or slug (S.).
Shei, A shell (of sea, or nut) (S.).

Shekeribe kina, A plant long-leaved like the lily, the Ainos eat the berries.
Shep, Broad (S).
Sheppa, The guard of a sword (S..
Shera-mui, To bind.
Sherimbu (Jap. kiseri), Tobacco pipe, (Pfz.).
Shesheku or Shiri-sheshike, Hot; Shino shesheku, very hot.
Shesh'ke, To shut up mouth of cave.
Sheta, A dog; — nimbu, dogs drawing, pulling.
Sheta chipp nimbu, Dogs drawing a boat.
Sheta toyash'kara, Afraid of a dog.
Shettok', Elbow (S.).
Sheturu, The back (of the body.
Shhiumoi, Simple negative.
Shi, Great (Kr), horse dung.
Shibe, Salmon (S.), cf. akiangi.
Shibuya, Smoke (v. ba. Kr.).
Shichuk (Kr.), (v. chōk (S.), Autumn.
Shi-ei, Blue.
Shigi, Tired; Shigi an-be, to be tired (B.).
Shihopp', A box; Shipop, Pfz.
Shik', Full.
Shika doro, Small fox.
Shikai, A nail (S.), tack, small nail.
Shikari-kari S.), To go round, revolve.
Shikarimba, A circle, ring, round.
Shikarimba ra, To make to go round (S.).
Shikaripp', A wheel.
Shikarun, To learn, to remark, to notice (Pfz.).
Shikashima, Put away to take care of.
Shikeu, An angle or corner (S.); Repshikeu, triangle.
Shike wa ap'kas', To walk with a pack on back (S.).
Shikki, An eye; — rapp, eyelash.
Shikki hi, Eye (of a dog).
Shikki-numi, Eye-ball.
Shikki-shaku-wa (like one), Without eyes.
Shikki-shama (Kr.), Eyelashes.
Shik-nak, Blind.
Shik'nu (S.), Living.
Shiko, To bring forth.
Shikoba, Example.
Shik-rapa, To blink.
Shikunda-ch'üpp, May (Kr.).
Shikus'saki Kr.), To take cold.
Shimari, A fox (v. chironupp).
Shimauda chüpp, Month of May,
Shimbui, A well, fountain (Kr.).
Shimon, Right; Shimon tek', right hand.
Shimo-wa, No.
Shin, Bitter (S.) Shiu.
Shiná, To bind.
Shinan chüpp, November, 10th month.
Shinanta, With one another.
Shiné-rai-no-kara, To accompany.
Shiné-ha-u-e, One voice.
Shiné ikashima wambe, No. 11.
Shiné-ni (cf. nin), One man.
Shinep' (Shiné, shné), One.
Shiné-rai, Companion on same road.
Shiné-to, One day.
Shine-to-karambe, Made in one day S.).
Shiné-to ke-utomo, Unanimous.
Shingi, Family, origin (hingi).
Shini, To rest.
Shinki, To blink.
Shinna, Is the one, i.e. the right one (S.).
Shino, Raised place for boxes, etc.
Shinóchi (S.), Amusement, music and dancing.
Shinos'ki aekibets nakkambe, Middle finger.
Shin richi, Jugular vein; v. riji.
Shin-rit', Genealogy, family.

Shin-rush? Moss. (S.).
Shintoku, A vessel; Kem shintoku, — with feet.
Shinuke shiomo-ki, It is no lie.
Shinumo, Calm, quiet, at rest (Y.Q.).
Shinzi chupp', The third month.
Shiō, Waterfall (S.), (Shoratki).
Shioke, Around; Chiséi shioke, the house.
Shiō-kora, To borrow.
Shiom, Not 不 or Shiomo, not so (S.); Shiomo-ki, it is not.
Shiomo nukara (S.), Has not seen.
Shion, True; Shionno, truly (S.).
Shionno itaku, To speak truly.
Shionno pirika, Very pretty (good).
Shionno shiuruku, A poison called 烏頭, "Raven's head."
Shiōra To lend; Chiséi shiōra,—house.
Shio-ratki, Waterfall (S.).
Shiosi-oma, To draw back the skin.
Shipo, Salt; — us chepp', salted fish — shi, salt salmon.
Shirambi kamoi, Wood-god (S.); sea-bird with long neck.
Shiramke, Have been (S.).
Shirani anguru, Sometimes.
Shiranno (S.) (Kf.), Calm; Atui shiranno, sea is calm.
Shi rapp, "Great wing," Eagle.
Shirára, Rock.
Shirara kashita ush'ma, To graze over a rock (S.).
Shirar' amam (meshi), Cooked rice.
Shiraramo ushma, To strike on a rock (S).
Shirarapesh, The tide coming in (S.).
Shirar' ha, The sea going out (S.).
Shirasopu, Kind of eagle (Kr.).
Shirau (Jap. abu), Gadfly (S.).
Shiri, Earth; Shiri uturu, frontier; Shiri etu (nose), promontory; Shiri shimoi, earthquake.
Shiri, Very.
Shiri bekere-etoko-ta, The first appearance of the morning light.
Shiri etoko, Original nature.
Shirigi, Of earth.
Shiri-he, Ebb of the tide.
Shiri ika, Flow of the tide.
Shirikani, Silver.
Shirikani wakka, Mercury.
Shiri kata, Ground, floor.
Shiriki, Form, shape.
Shiri koro kamoi, God of the earth?
Shiri kunne, Darkness.
Shiri-pop'kéi, Heat.
Shiri seshike, Heat.
Shiri ship, Broad (v. Shep); shiri bokke, (ainame?) fish.
Shiri ufui, Conflagration; shiri mimun, cool.
Shiròma chisei, Dwelling house.
Shiron-guru, Poor man, destitute.
Shiroteterike, To stamp the feet in rage.
Shiroze kara kara, To stamp the feet in rage.
Shirtu (for shiri-etu q.v.), Cape, promontory.
Shiru-chiri, Green woodpecker.
Shiruru, The tide coming in (Pfz.); v. shirarapesh'.
Shirushi mura, Place near Sapporo. Shuruku abounds there.
Shi sham, Japanese.
Shi shamór moshiri, The chief island of=Japan, Honshiu.
Shi sho ye, To wave about, sway about.
Shisui, Dirt, round; Shisui yehi (S.) marks on mud.
Shitaike, To strike (to punish, Dx.).
Shitai keshite, Having struck.
Shitappa, A blister (Kr.).
Shitoma, Fear.

Shitone, 今日, To-day.
Shittaye guru, Darkness.
Shittok, Elbow (S.).
Shittoki (Kr.), Necklace, head-string.
Shittum bekere, Daybreak.
Shiu (S.), Bitter.
Shiu (kama), A pot for boiling.
Shiu, 磯 The stony brink of a place where water lies.
Shiui, Once.
Shiu-niu (S.), Green, (or yellow) one says green, another yellow.
Shiu-nin-gane, Brass.
Shiunke, Lies (Pfz.).
Shiunke-shomo-ki, It is no lie.
Shiunku, 唐檜 (Yezomatsu).
Shiu-ruku, The poison of aconite with which the Aino arrows are charged.
Shiu-shiu (Shu-shu, Susu), The willow.
Shiu tas'pari (Jap. awaseru).
Shiu-wat, The pot-hanger.
Shiumdera, The west.
Shiya, Sister (Kr.)
Shiya, Summer (Ms.).
Shiya chiri, Silver rat (obashchironupp).
Shiyuk, The male bear (S.).
Shiyau, 瀧 Jap. taki, Waterfall.
Shiyetoki-ramu, To think of the future, to go away and show to another.
Shiyeye, Sick (shiuyée Sch).
Sho chike, Sleeping place of master (Sie).
Shoi mas'ke, Carp (S.).
Shoi naki, Outside.
Shoi ni, Go out!
Shokai, Kingfisher (S.).
Shokushan, Weather (S.).
Shom, v. Shiom, Not without.
Shōne, A torch; stick with slit in it.
Shōne-kara, To set up a light, torch.
Shopuya, Shopuya nuburi, Burning volcanic mountain.
Shōri, Sledge (Jap. sori); Shōri nimbu (S.), to draw a sledge.
Shoshipa, To tear.
Shosho inao, (v. Inao).
Shoya, A wasp, bee, hornet.
Shoya shot'cha, Bee stings (sashimas).
Shu, A pot (to boil), (S. Shiutu)., Shintu.
Shu gaku, Stitch (Dx.).
Shui, A hole, cave (S.).
Shu-ke-an, To boil (S.).
Shukui, Sour (S.).
Shŭm, Oil (enjo matsu.
Shumamge, To wither.
Shu ne an aino, A sandal.
Shungu ita, The wood of which sea-going ships are made.
Shurku, Aconite (Sch.), poison, v. Shiruku.
Shuruku, Gen. name for poison.
Shyumu, The west.
Shu-wat, The pot hook, hanger (S.).
Shuk-gu, Cedar nuts.
Sikáris-khemaka chupp, (Db.) Full moon.
Sikki (Shikki), An eye.
Skannash'ki, Chisel.
Skerébe, Yellow (Sch.) (S.).
Skeribéni (Shikoro ki), Name of a tree.
So, Contraction for water?
Sofukara (Kr.), A mat.
Soida, Board (Kl.).
Soko-ni, Elder (tree.).
Sokondokur, Chief officer of justice (Sch.).
Soma, Goods.
Somawa, Restless.
Somba, Buckwheat (Sch.).
Somo-itaku (Shiomo-itaku), Dumb.
Son, (Shon), True.
Son dak, A small child.
Sonno (Shonno), Truly.

So oroku koboi, Poison, (? Shuruku).
Sŏrŏmă, A brake fern.
Sot'ke, Sleeping place.
Sukoshi kikiri (bumbum), K. of beetle.
Sukubene, Saphora japonica.
Sunge, To send forth.
Sunoba, Rumex.
Surubu, Prism.
Surugu (Shuruku), Plant from which aconite poison is obtained.
Suruka, *Acornus calamus*, aromatic root of the sweet flag.
Susu (Shu shu), Willow tree (S.).
Susu wakka, Vinegar.

T.

Ta, To draw (water).
Ta, 製 作, 取 toru, To take.
Ta, In; in respect to=於.
Tabara, This.
Tabera, The shoulder blade.
Tabsuda, The shoulder (Sch.); v. Tap-shu.
Tagabai, (Kl.), Small crayfish or crab.
Tagaka (Kl.), Medium sized crab.
Tai, To break off? Teppō tai, the stock of a gun (S.).
Taibe-on, To halt, break off.
Taike (Daike), A flea.
Takine, Short (Kl.).
Tak'tak'e, To mould balls in the hand (S.).
Tamba (Jap. tama), A precious stone.
Tambaka (tabacco), Tambaka poron no iku wa, I have smoked much.
Tambi, This.
Tampa (S.), This year (Tanpa).
Tampata, This side (river, etc.).
Tampata an, Is on this side.
Tamutui, Almost.
Tan, This; Tan-to, to-day.
Tan ashi, Upright; vertical (S.).
Tan do, To-day (M.).
Tan guru, This man; Tan okuran, this night.
Tan chĭséi, This house.
Tane, New, 今; Tane an kesh, the present break of day.
Tanebo, Now.
Tanne, Long; Tanne okoko, long snake (not venemous).
Tan ne chi nika, To stride along.
Tantaka, A flounder.
Tap chikiri (S.). Fore leg of an animal (dog).
Tap'kara (S.), To dance.
Tap'ne, Really.
Tap' ne an chiki pirika, It is good; uniform.
Tapshu (S.), Shoulder.
Tap'ush etunap (S.), K. of ant? Yellow ant.
Tarara (S.), To point; Askebet' tarara, to point with the finger.
Taratarak (S.), To rub? or rough.
Tarembok, Eyelids.
Tashi koro, Frost (?) Dx.
Tashipe, The seal.
Tashiro, Mountain sword; knife.
Tashiro nit', Handle of sword, girdle-knife.
Tashiu, The air.
Tatne-nitni-okoko (v. Nitne.....).
Tatoshipi, A torch.
Tatu (Tat' tach'), A torch.
Tau be ibaki, The end; the upshot.
Te, A particle,=making what the root expresses.
Te-da, Under your hand (Teta), here.
Te-eta, Ancient (S.).

Te hott' ikashima wambe, Fifty years, v. Tu-hott.
Tei-ne, Damp, opp. to Shat'ke, dry.
Té-ire (Tére), To wait; Téire! Téire!
Ték' (Teki, Teku), The hand.
Tekakĭ shiomo nukara, To look to a distance with the hand over the brow.
Teke-hinuye, The tatoo marks on the hand.
Tek' ei, The arm,
Tek' emika, Touch of the hand.
Tek' kotórŏ, The palm of the hand.
Tek' kupshi, Wing (S.).
Tek' sambi, The pulse.
Tek' ubi, Wing.
Tek' umbe, Above and below the hand.
Tek' utnene, The wrist.
Teku kot', The wrist (S.).
Teke nimbu (S.), To pull the hands (as policemen do).
Tekka, A kind of eagle.
Tekkeshi, Below.
Teppake, Above; super.
Teppô, A flint.
Terike (Teriki), To jump (S.), to spring over.
Terike-ibe, The frog; "the jumper" (S.).
Teshikau, To tie (S.), bind (rushes in a fence).
Teshima, Snow shoes.
Teta ek (S.), Come here.
Teta ogai menoko utare, The women who are here.
Tetaru kuu kut', A kind of eagle.
Teta wa no, In being here (Pfz.), just at hand, here (S.).
Tetari tama, The white of the eye.
Teu-nin, Green.
Tô, A swamp; a pond; Tô be, — water; that is, the breast milk.
To ambi, That; To ambi isham, without that.
To-amni, There, yonder.
Toanda, There (in front.)
Toan guru, That man, him.
To-an nun arapa, To go there (S.).
To ben, Sweet.
To-bekere, Day-light.
Tobikashima hott, 2 more 20=22.
Tobishi, Consumption.
Tō-chi (tsuchi), A hammer (S.).
Tōdi (S.), A wine cup.
To-etanne, 5th month (long day).
Togui-ne-wa, What concerns the companion (Pfz.).
Toi 地, Var. of mai, nai.
Toi, Soil; earth; Toi-toi karushi, earth mushroom.
To-iku-ri, To give suck.
Toima, Distant (S. Kr.).
Toi-omare, To lay in the earth, as a corpse.
Toi torenga, An earth worm.
To-kan, Two piece (birds).
Tokap (S.), Midday; Tokap ibe, dinner.
Tokap, To sing (as a bird).
Tokap chüpp-kamoi, The sun-god.
To kápu, A hook.
Tokara, Seal, (B.) and (S.)
Tô-kesh', Afternoon.
Tokets (for tokep) 晝 Noon (MS.).
Tō-ki 日, The day (MS.).
Tokitok', An owl.
Toko bone, The uncle.
Tokoni, A snake (S.) (mamushi).
Tok'pa, To peck (as woodpecker) (S).
Tokúi, Friend.
Tokushi, The masu (salmon caught in the "rainy season".
Toma, N. of plant, very bitter (Krf.), Ainos eat; Tomakashi, a yoort made of sewn skins (S.).

Tomamuni, A stick used in weaving.
Tomari, To rest, also Jap. but true Aino word.
Tombi (Kr.), Sun or moon (Pfz.).
Tomikoro, War.
Temi koro guru, A soldier.
Tomo kai guru, The man who steers (D.).
Tomo nishipa, An officer.
Tōm'shi, A towel stick, hanging (S.).
Tona shino, Quickly.
Tonín (S.) (prob. Toi-nin), Earthworm.
Tono, Government official (Jap.).
To-noshike ibe, Midday meal.
Top-endo, Arm (to the elbow).
Top'kara, To dance (S.).
Topopkene, In a bear's trap the piece of wood on which the arrow lies.
Topp', Bamboo.
Topp iwara, To blow a bamboo flute (S.).
Topeni (momiji), Maple.
Top'nekta, To play a flute.
Top'rette, A flute (S.).
Top'se, To spit (tupshin?).
Toro-nishipa, Master.
Toranne guru, A lazy man.
Toro-no, Together with.
Tosha, Sleeve; Tosha shak'imi, clothing with sleeves.
To shir (prob. Toi-shiri) Grave (S.)
To-shiri, To bury.
Toshi-am, To hold; Umma toshi-am, to hold a horse.
Tô-to, The breasts; Tôkapu, milk, of the breasts.
Totonup (kaya), A kind of rush or reed for thatching (S.).
Towerarip, The loop which keeps the catch; v. hetsuhawe ni, the catch.
Toye, High.
Tu-hottne ichi-ri, 40 ri (S.) 2 × 20.
Tui, To cut (var. tuye); Tui kem-ikoro hetoko, cut, blood springs out.
Tui tek' To be broken off.
Tukap, Fish hook; Tukap ka, fish hook line.
Tukkoro, Beautiful (? tukare).
Tumu, Colour.
Tumuku, Middle.
Tun (or dan), Grass, cf. mun.
Tunai, Kind of whale.
Tunashi, Soon.
Tunin (tonin), Earthworm.
Tup (Tu-ep), Two.
Tupin (tobi), Sweet.
Turano, And.
Turep, The mullberry; the berries of which Ainos eat.
Turesh' (Kr. S.), Younger sister.
Tushiu, To tell fortunes by diagrams; to soothsay.
Tushiu-guru, A wizard.
Tu-shin-ni, Twice; Tuni, two men.
Tuwara, Damp; tuwara ika, to moisten.

U.

U, Expresses reciprocity, mutuality, like 相 tagai.
U 爲 tame ni), For the sake of.
Ubara (Upara) Soot, lampblack.
Ubash (Wubashi), Snow.
Ubash' karbe, Snow shoes (Sch.).
Ubashi kuma, Preaching, story-telling (S.),
Ubani, Argument.
Ubarashi chepp, Smoked fish.
Ūbeka (Ūpeka) (S.).
Ubobo, To sing, to dance.
Uchikam', Calf of the leg, (S.).
Uchi'om, The seat, ham (S.).
Uchogai, You.
U-e-bekere, Old story, of old (S times.).

Uen, Bad, ugly, dirty, poor (S.).
Uen chkap, For a raven or crow.
Uen-darupú, A dream.
Uen-de, To make bad.
Uen-kamoi-shei, A certain shell, long-bivalve.
Uen-kara, Poor.
Uen-tarup, To dream.
Uen-te-peripa (S.), Gone to pieces (of shipwreck).
U-e-shin, Different; U-e-shin Aino, an Aino from another place.
Ue-shiye ye, Syphilis, prob. for Uen-shiye, "bad sickness."
Ufu (Uku) To blow, v. Ugu.
Ufui-ka, To burn.
Ufui nuburi, Burning mountain, volcano.
Ugau-gawa, To finish sewing.
Ugau ka, To sew; Ugau amip, to sew clothing.
Ugu (Uku), To blow (cf. Jap. fuku).
Uina (prob. for Fui-na) ashes.
Ui seta, Bad dog (Kr.), contempt.
Uk', To pick or peck up.
Ukamukiri 態 Intentionally.
Ukantumnu, To collect.
Uko-boi, To mix, blend (S.).
Uko-etai, To pull against.
Ukogaran, To associate.
Ukoibishi, To ask, enquire.
Uko-ibish, To ask.
Uko-iki, Quarrel.
Uko-karakani, To roll up, wrap up tapambe —.
Uko-niki, To wrap up (a bundle).
Ukorachi, (同 onaji), The same (S.).
Ukorani guru, To prepare.
Uko tomi, To make war (S.).
Uku, To take.
Uku-oba, To be heaped up (v. Etoe púni).
Ukuribe, An eël (S.).
Ukush-ukush, To stride.
Umaki, To break something (S.).
Umani, Evening, v. Numan.
Umau-kushini, K. of cherry.
Umganchi, The leading oar, used as rudder.
Umi, To tatoo.
Umma (Jap.), A horse
Umma toshi ani, To hold a horse.
Umma uwe toshi mak', Horse-races.
Um nani-o, To collect.
Umurek, The married couple (Sch.).
Umurui, Night (Nocte).
Umuyash'karu, Known.
Un, Genit. particle, freq. like Japanese *no*.
Un'arabe (.... ba) An old woman, obasan, nurse, etc.
Unarbe, Aunt on both pat. and mat. sides (Sch.).
Une-no-an, The same, similar.
Unji, Fire (Db.); In abe unji, to make a fire.
Unta, Hindmost part of a ship, stern.
Unwoshi, To tie a knot.
Uoboki no, By degrees.
Uo-hoki-no (dandan), Gradually.
U-o-mare, To pick one at a time.
U-o-one-itasha, To change, vary.
Upakushinni, Level (S.).
Upara (Ubara, obara), Soot, lampblack (S.).
Upshi (S), To turn over (as ship); chipp —.
Uráïke, To fight together and kill (S.).
Urai-ni, A pole or post (in weaving).
Uraki, Louse, war (Db.).
Uranye, To flatter.
Urari, Fog, mist.
Urari-ats' It is cloudy.
Ure, Foot (S.).

Ure asham, Sole of the foot (S.).
Ure bet, Toes (S.), Zehe (Sch).
Urei-baku chepp, October.
Ure mekka, Instep (S.).
Ure-met'ka, Toe-nails.
Urun (perhaps arun) Going? cf. Pet urun chipp.
Usarai, To divide, separate (H.S.).
Ushamo'ush, Near to one another.
Ushei, Tea, an infusion of any plant.
Ushiarai, To pay the rent.
Ushike, Pith; — retara, pith which is white.
Ush'ka, To extinguish, blow out.
Ush'ka-ush'ka, To extinguish (fire); Abe ush'ka-ush'ka.
Ush'ko, Old.
Ush'pe, An animal?
Usu, (Abuta) N. of place where there is a volcano, ushiyoro, 入輪.
Utara, Rock.
Utare (ri), Companion; friends; sign of plural (=等 ?).
Uta, ship ship (a fine, jointed, fluted grass), Equisetum.
Utashare, To fold up; to wrap round; Numsham utashare, to draw the collar up on account of cold.
Utatan ash'kibet, Index-finger.
Uteni-chepp', Live fish.
Utnet' (Utnechi), Rib (S.).
Utukani, The Cornus brachypoda (Sch.), K. of cherry.
Utumash', or Utuyash', To increase (Dav.).
Uturu, Boundary; frontier (方).
U-um neri, To know (?).
Uunai ke, Hollow? or empty (S.).
Uunep-kikiri (bufô mushi), A kind of stinging fly.
Uunwosni, To tie a knot.
Uwe kariri, To hoard up.
Uwe noi, To twist..
Uwe pash' pash', To bow politely (S.), after an interval of seeing.
Uwe shin nai no, Various; different, v. Ueshin.
Uwen tarup, To dream..
Uwetoshimak, Races (horse, boat, etc.).
Uyekaru Jap. 成 餘 jō gyu.)
Uyemam, To seem.
Uyenmoki, To tumble.
Uyen (v. Uen), Bad.
Uyeshiren, Please.

W.

Wa-ashinno, A learned person (S.).
Wabashi (Ubash'), Snow.
Wagashinu, Wise.
Waki-otenna, Vice-officer of justice (S.).
Wakka, Water (S.); Nam wakka, cold water.
Wakkashiu (U.), To wade, cf. Pet' kashiu.
Wakka shin, Sweat.
Wambe, Ten; Wambe pa, ten years (S.).
Wan no as', Upright.
Wano, From (of time).
Waran toka, A fish (? Sly Silurus).
Watara, Rock.
Watareri, To sink.
Wattesh, Straw.
Wa-wo-haru, The red berries of the Shokoni (S.).
Wen (v. Uen), Bad.
Wen-darapú, A dream.
Wen-kara, Poor.
Weshi ye (v. Ue-shiye), Syphilis.
Wo, A span w. thumb and 1st finger.
Woron chkapp, A wild duck?
Wotta (v. Ōtta), In, to.

Y.

Ya, A fish net.
Ya, Interrog. particle.
Ya-ára-ki dai chīsé, A house covered with bark of tree.
Ya-atotta, A kite, hawk.
Yabeka, Land.
Yabui, Tatoo marks on hands (Sch.), net-meshes.
Yadai kugi, The side.
Yahi, A mark or trace.
Yai (kari-ni 假), temporarily, for a short time only.
Yai, Reflexive prefix; self (midzukara).
Yai-baro-ush, Comic (Pfz.).
Yai-kane, Lead or tin.
Yai-kap, Awkward.
Yai-kimaiba, disobedient.
Yai-kipta, Stings (S.).
Yai-kipute, Take care!=Yai ramutto.
Yai-kobekeri, To decide.
Yai-kopeki, Wisdom.
Yai-koyoni, To answer.
Yai-koyaru-min-kare, thanks!
Yai-mono, Proud.
Yai-mone kute, An accident.
Yai-no, To think, (Pfz.).
Yai-no-kanna-kara, To be ashamed of self, (Pfz.).
Yai-no-kuri, Full of trouble, (Pfz.).
Yai poro garapte, To lie, tell lies.
Yai rai kere, Many thanks to you (O sayônara).
Yai rai-ki ongami an, Thank you!
Yai-ramatte, To be weary.
Yai-ramu, To be attentive, (Pfz.).
Yai-ramu-omare, To be full of trouble, (Pfz.).
Yai-ramutte, Thanks!
Yai-renka, Goodness; grace, (Pfz.).
Yai rukai (chōtto), A little while; a little.
Yaishi horore, Not just.
Yai-shin naide, To avoid.
Yai-shitoma, To be ashamed, afraid.
Yaishtokų o-ike, To prepare.
Yai yan gari, I am.
Yai ye toku o-iki, To prepare (S.).
Yakai-e, I thought (S.), (final).
Yaki (semi), Cicada; tree hopper (S.).
Yakite, Dangerous.
Yam, A chestnut.
Yam-ni, A chestnut tree.
Yan, Sign of Imperat.
Yan-garap'te, The salutation, to be extended, v. Igan garap'te.
Yan gi not'ka, Aino name of Zenibako, 10 miles from Sapporo.
Yan to-ashi, To boast.
Yap' shu, To rise up (?).
Yarambe, A rag.
Yarube, A boy?
Yaru, February.
Yaruru chepp, August.
Yashamo, A common man.
Yashitomo, Shy, awkward, afraid.
Yáso (yásho), A three-pronged spear for salmon (Sch).
Yata, Land (opp to sea) ridge of a hill.
Yatui, A kite (tombi); — kari, the flying or hovering of —.
Yauka-oka, To sew.
Ya-un-koro, This island.
Ya-un shi shamu, Japanese person.
Ya-ush'skip, Spider (S.).
Yayánkúr, Inhabitants of a village (Kotan).
Yayapu ke, To cut yourself.
Ya yoroba (表 mo).
Ye, To eat.
Yechi yan, A canal.
Ye dapkara, Woman stretching out arms in dancing (S.).

Yemosi atsu, Kind of sheath for sword (v. Emushi) borne on right shoulder.
Yo-agire, To drop, let fall (?).
Yōbe, Sturgeon, or sturgeon-like fish (S.).
Yōkara, The chanting of Buddh, Dhârani.
Yok'pe, A sickle (kama).
Yon giri, (v. yo-agiri).
Yonte kami, To wade.
Yōoki (dani) A tick (S.).
Yop, (v. Yopama) A lance.
Yoraboi, Anus.
Yoshiwa, behind; — ariki, come after.
Yosuki, Drunk.
Yūbi (or yūbō, either will do) Elder brother and for any brother (Sch).
Yubke tasum, Severe illness.
Yukar, A war song.
Yuki, A brace (in building).
Yukk, A stag, — v. ap'ku, the buck (S.) momambe, the doe.
Yuk'lam, The lungs of the bear (Sch).
Yuk'ram, The lungs (S.).
Yupke, Hard, violent.
Yupkenu, To be strong.
Yupk guru, A strong, violent man.
Yu natara, Strong.
Yurushkia, Sorrow.
Yuto nep, Bowl with a spout for wine.
Yuwanke (用 yō ni tatsu), Useful, serviceable.
Yuwanke, Good-hearted.

PHRASES IN THE SARU DIALECT.

1. Onuman arigi isham. — Did not come yesterday.
2. Nishatta Tsuish'kari arapa rushiu ni. — I am thinking of going to Tsuishikari (an Aino village near Sapporo) to-morrow.
3. Arapa-rushiu koro kā kopan (ikitai temo, ikare nai). — I would like to go, but I cannot.
4. Kupka ni toi o-ure. — To till the ground with a mattock.
5. Tambe arapa-koro wa ek. — Fetch it.
6. Shiné-ni ikashima. — "One man too many".
7. Yai-rai-kere-ka i-ramu sh'kare. — Not knowing how to give thanks, (impolite).
8. Nep-ne-yakka poronno an chiki shino pirika wa. — Whatever it is, if plenty, it is good.
9. Tan guru emushi ani chironopp kekki. — That man is striking the fox with a sword.
10. Nuburi kidai chikuni hetoko. — On the mountain top trees spring up.
11. E-yui-ko-pun-tek. — I am very glad indeed!
12. Shō mo nukara. — I have never seen it.
13. Numan shokushi uen. — Yesterday was bad.
14. Tanto shokush' pirika. — To-day the sunshine is good,=it is a fine day.
15. Iku-sham-oki. — She does not drink.
16. Shik'nu korachi. — It looks, as if alive.

17. Tan-guru hokamba. This man is difficult (hard to manage.)
18. Tupp' chiramantep shiné yukf'ke-shi-amba shiné chiramantepp' ra-umi e háchiřī. Two bears one stag run after, one bear in the chasm falls.
19. Shiné sharorun raike an wa araki an. I came and killed one crane.
20. She' epp' kerawe nuina. The snail draws in its horns (antennæ).
21. Teke tuye annoshike shina. I bind up some wound on my hand.
22. Tan inao kokóro-kotan ta (? for òtta) kokoro wa karapa. These *inao* I will take to my country.
23. Ekóro achabo onak'ta arapa. Where is your father gone?
24. Me-än ba ekk.' The cold year comes,=Autumn.
25. Ashire-pa-ekk. The new year comes,=Spring.
26. Tane kokoro be yai-ye-toko-o-iki. To prepare my things to-day.
27. Tan ne chi ni ka púni ap'kash' reye. He comes creeping along on all fours.
28. Yuk' aï-nan ani makanit' i-an. The *makanit'* just below the head of the arrow is made of deer shin-bone.
29. Hippopotamus pet asham peka ap'kash'. The hippopotamus walks inside the river.
30. Eraman iya? Do you know?
31. Pon eraman. He knows little.
32. Otaru ta ishí ram'ke a? Have you been to Otaru?
33. Tetsu ani akara chipp'. A boat (ship) made of iron.
34. Poro chipp kara ashikai. He made a great ship.
35. Umma uwetoshimak,—chipp—— Horses racing, boat racing.
36. Otaru ta arapa a? Have you been to Otaru?
37. Op' ani otke. To transfix with a spear (harpoon).
38. Shak'né pa kuáni Sat'poro-ta ku-ek. I came to Sapporo last year.
39. Ku áni atuï-orun-chipp te ani ku-ek. I came in a sea-going ship.
40. Tan ru yachi porono an. There is much mud on this road.
41. Tan kotan wa hembara e-yo-shipi ya? When are you going back?
42. Satporo hembak' hott anru ye an? How many men in Sapporo?
43. Tan gura ihahara e ashikai. I found this man.
44. Tan nuburi porono urári ran. There is much mist on that mountain.
45. Ke-utomo an koro kushiu ne. As it is really your intention.
46. Onuman tu-shiyuk teppo ani ku raike. I killed two buck-deer yesterday with a gun.
47. Oya-pa Saru-ta karapa-rushui. I wish to go to Saru next year.
48. Yangarapte, shionno-ka i-koraki-ne-guru-pō ne-no-an na (Pfz.). I greet you truly, it seems really (my) uncle (Pfz.).
49. Karafto guru Saru guru muko tomi ăkosho Karafto guru a annukara. When the Karafto men fought with the Saru men the Karafto men were defeated.

50. Tatne-nitni-okoko (n. of snake) iku-pápa koro netobáke ebitta fūp wa ashi-to-má. Snake bites and the whole body swells; I am afraid.
51. Kanna kamui fūm'ashi kushiu shake iteki iku no oripak wa an somoi yak' ni kamui irushuika na? As it is thundering, the god I fear is angry is n't he?
52. Tan-chikuni pashi kushiu reri ku ni aramu a kushu shiumu yakai-e. As this wood is heavy, I thought it would sink, but it is not so.
53. Atui réri upshi'ri. To turn over and sink in the sea.
54. Reira yupke atui-run chipp wen-te-peripa. The wind being violent the sea-going ship went to pieces.
55. Kira wa pash'. To escape and run.
56. Bet' chipp ka'ra chikuni *ranko*. River boat is made of the wood *ranko*.
57. Atui orun chipp kara chikuni *shungu*. Sea-going ships are made of *shungu*.
58. *Shungu-ita* ani chipp a-a-kara, peturun chip *pinni* a kara. With Shangu boards ships are made; river boats are made of *pinni*.
59. Peturun chipp ni *aushni* a kara. River boats are made of *aushni*.
60. Tan chikuni petoro a-omare a kushiu reri. This wood put in the river sinks.
61. Horak chikuni mo-nin ni *orota* porónno an. He was speaking of a heavy wood.
62. Chiuri orota komba etara. To the Cockle shell the Kombu grows.
63. Chiramantep ekwa ishitoma kushiu kira wa huyupu-chikuni kunfmu. As I am afraid when a bear comes I escape by running and climb a tree.

TABLE OF ERRATA

IN PAPER ON THE TENETS OF THE SHINSHIU.

[*Transactions Vol. XIV, Part I.*]

Page 2, line 5, etc., from bottom of page. Dele from "The expressions" etc., to "of the Shinshiu", and read:—"This name is derived "from the expression 'Nem-Butsu jō-Butsu ji Shinshiu' (calling "Buddha to remembrance and attaining Buddhahood constitute "the true sect [or doctrine])."

Page 3, line 14, etc., from bottom. Dele from "He has extended" etc. to "North Star," and read:—"He has renewed and promulgated "a hundred (numerous) regulations; within the Seas he is "respected and not less conspicuous than the Mountain Tai and "the North Star."

Page 3, line 9 from bottom. Insert comma between "Law" and "Gen-nio."

Page 4, line 6. For "Sutra", read "Sûtra." For "Sukhavâtî Vyuhâ," read "Sukhâvatî Vyûha."

Page 4, line 11. For "enabled," read "unable."

Page 4, line 27. For "Pundarîka," read "Pundarika."

Page 6, lines 14 and 15, and 17 and 18. For "Witness [of attain- "ment]", read "Realization (Salvation)."

Page 6, line 21. For "Witness," read "Realization."

Page 7, line 14. For "Witness" read "Realization."

Page 7, line 9 from bottom. After "Doctrine," insert "(Teaching)."

Page 7, line 8 from bottom. For "(Action)," read "(=Means)."

Page 7, line 7 from bottom. For "faith and joy," read "believing "joy;" et sic infrà.

Page 7, last line. For "then shall I not accept," read "then may I "not attain;" and so in notes 13 and 14.

Page 7, last line. For "(Bodhai)" read "(Bôdhi);" et sic post.

Page 8, lines 1 and 2. Dele from "Surely the time" etc., to "Witness," and read:—"Surely the attainment of "Nirvana "is the true Realization (Salvation)."

Page 8, line 2, etc. Dele from "Zendo Daishi" etc., to "attain

Page 8, Salvation," and read:—"A great leader Teaches by Means of "the Name; which all living beings, hearing, Believe in, and "thus attain Salvation."

Page 8, line 2 from bottom. For "the Name," read "the Means."

Page 9, line 2. Dele "(laity?)"

Page 9, line 7. Dele "(priesthood)."

Page 9, line 16, etc. Dele from "They forsake," etc., to "Alas!" and read:—"They who forsake the family (i.e. enter the "priesthood) are like this; how much more they who remain "in the family (i.e. the laity). Alas!"

Page 9, line 23. For "almsgiving," read "Almsgiving."

Page 9, line 25. For "meditation" read "Meditation."

Page 9, line 28. For "knowledge" read "Knowledge."

Page 10, line 9. For "How incomprehensible!" read "How "should we not think of it!"

Page 10, line 15. For "I shall not accept," read "May I not attain."

Page 10, line 15. For "(Bodhai)," read "(Bôdhi)."

Page 10, line 23, etc. Dele from "they will throw out," etc., to "the "end of life", and read:—"then will Buddha throw out a "radiance and receive (favor) such. At the end of life, etc."

Page 11, line 15. Dele inverted comma at beginning of line.

Page 11, line 28. For "It is said in the Patriarchs," read "Our "Founder said."

Page 13, lines 2 and 3. Dele "(manifold)."

Page 13, line 4. Dele "by generation (natural birth)," and read "in "embryo."

Page 13, lines 8 and 9. Dele "or 'The system for the laity.'"

Page 13, lines 9 and 10. Dele "as expounded by the priesthood."

Page 15, line 8. Insert inverted comma at commencement of line.

Page 15, line 9. Dele inverted comma before "wickedness," and insert at commencement of line.

Page 15, line 5 from bottom. Insert inverted comma at commencement of line.

Page 16, line 9. After "Meditation":—, for "the," read "The."

Page 16, line 15. For "It is said in the Patriarchs," read "Our "Founder said."